

1/48

<http://www.ncbi.nlm.nih.gov/entrez>

1: AY207429. Homo sapiens inte...[gi:27501935]

Links

LOCUS AY207429 9803 bp DNA linear PRI 05-JAN-2003
 DEFINITION Homo sapiens interleukin 11 (IL11) gene, complete cds.
 ACCESSION AY207429
 VERSION AY207429.1 GI:27501935
 KEYWORDS
 SOURCE Homo sapiens (human)
 ORGANISM Homo sapiens
 Eukaryota; Metazoa; Chordata; Craniata; Vertebrata;
 Euteleostomi;
 Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
 REFERENCE 1 (bases 1 to 9803)
 AUTHORS Rieder,M.J., Carrington,D.P., da Ponte,S.H., Hastings,N.C.,
 Ahearn,M.O., Kuldanek,S.A., Rajkumar,N., Toth,E.J., Yi,Q. and
 Nickerson,D.A.
 TITLE Direct Submission
 JOURNAL Submitted (26-DEC-2002) Genome Sciences, University of
 Washington,
 1705 NE Pacific, Seattle, WA 98195, USA
 COMMENT To cite this work please use: SeattleSNPs. NHLBI HL66682
 Program for Genomic Applications, UW-FHCRC, Seattle, WA (URL:
<http://pga.gs.washington.edu/>).
 FEATURES Location/Qualifiers
source 1..9803
 /organism="Homo sapiens"
 /mol_type="genomic DNA"
 /db_xref="taxon:9606"
repeat region 1..278
 /rpt_family="Alu"
 /rpt_type=dispersed
variation 125
 /frequency="0.01"
 /replace="g"
variation 187
 /frequency="0.01"
 /replace="t"
repeat region 282..611
 /rpt_family="Alu"
 /rpt_type=dispersed
variation 357
 /frequency="0.10"
 /replace="c"
variation 447
 /frequency="0.01"
 /replace="c"

FIGURE 1

2/48

```

variation      509
  /frequency="0.09"
  /replace="c"
variation      970
  /frequency="0.01"
  /replace="c"
variation      970
  /frequency="0.44"
  /replace="a"
gene           1582..7566
  /gene="IL11"
mRNA          join(1582..1651,3014..3186,3386..3472,3584..3745,
  5778..7566)
  /gene="IL11"
  /product="interleukin 11"
CDS           join(1645..1651,3014..3186,3386..3472,3584..3745,
  5778..5948)
  /gene="IL11"
  /codon_start=1
  /product="interleukin 11"
  /protein_id="AAC13493.1"
  /db_xref="GI:27501936"

SEQ ID NO :1
/translation="MNCVCRLVLVVVSLWPDTAVAPGPPPGPPRVSPDPRAELDSTVL
LTRSLLADTRQLAAQLRDKFPADGDHNLDLPTLAMSAGALGALQLPGVLTRLRADLL
SYLRHVQWLRRAGGSSLKTLEPELGLTLQARLDRLRRLQIIMSRALPQPPPDPAPP .
LAPPSSAWGGIRAAHAILGGHLHTLDWAVRGLLLLKTRL"

variation      1671
  /gene="IL11"
  /frequency="0.01"
  /replace="a"
misc feature  2109..2947
  /gene="IL11"
  /note="Region not scanned for variation"
variation      3451
  /gene="IL11"
  /frequency="0.30"
  /replace="a"
variation      3638
  /gene="IL11"
  /frequency="0.01"
  /replace="a"
variation      3651
  /gene="IL11"
  /frequency="0.01"
  /replace="a"
variation      3835
  /gene="IL11"
  /frequency="0.01"
  /replace="a"

```

FIGURE 1

3/48

<u>variation</u>	4064
	/gene="IL11"
	/frequency="0.04"
	/replace="g"
<u>repeat region</u>	4196..4511
	/rpt_family="Alu"
	/rpt_type=dispersed
<u>variation</u>	4267
	/gene="IL11"
	/frequency="0.38"
	/replace="t"
<u>variation</u>	4802
	/gene="IL11"
	/frequency="0.18"
	/replace="g"
<u>repeat region</u>	5003..5113
	/rpt_family="Alu"
	/rpt_type=dispersed
<u>variation</u>	5108
	/gene="IL11"
	/frequency="0.15"
	/replace="a"
<u>repeat region</u>	5116..5426
	/rpt_family="Alu"
	/rpt_type=dispersed
<u>variation</u>	5154
	/gene="IL11"
	/frequency="0.01"
	/replace="t"
<u>variation</u>	5157
	/gene="IL11"
	/frequency="0.23"
	/replace="a"
<u>variation</u>	5199
	/gene="IL11"
	/frequency="0.03"
	/replace="c"
<u>variation</u>	5288
	/gene="IL11"
	/frequency="0.41"
	/replace="c"
<u>variation</u>	5970
	/gene="IL11"
	/frequency="0.01"
	/replace="t"
<u>variation</u>	6068
	/gene="IL11"
	/frequency="0.01"
	/replace="a"
<u>variation</u>	6077
	/gene="IL11"
	/frequency="0.02"
	/replace="t"

FIGURE 1

4/48

variation 6092
/gene="IL11"
/frequency="0.17"
/replace="a"
variation 6212
/gene="IL11"
/frequency="0.15"
/replace="g"
variation 6448
/gene="IL11"
/frequency="0.10"
/replace="a"
variation 6494
/gene="IL11"
/frequency="0.10"
/replace="c"
variation 6576
/gene="IL11"
/frequency="0.11"
/replace="a"
variation 6591
/gene="IL11"
/frequency="0.05"
/replace="t"
repeat region 6592..6897
/rpt_family="Alu"
/rpt_type=dispersed
variation 6656
/gene="IL11"
/frequency="0.05"
/replace="g"
variation 6669
/gene="IL11"
/frequency="0.18"
/replace="g"
repeat region 6984..7169
/rpt_family="L1"
/rpt_type=dispersed
variation 7083
/gene="IL11"
/frequency="0.17"
/replace="a"
variation 7161
/gene="IL11"
/frequency="0.07"
/replace="a"
repeat region 7170..7298
/rpt_family="Alu"
/rpt_type=dispersed
variation 7249
/gene="IL11"
/frequency="0.33"
/replace="c"
repeat region 7299..7523
/rpt_family="L1"
/rpt_type=dispersed

FIGURE 1

5/48

<u>repeat_region</u>	7700..7835
	/rpt_family="MIR"
	/rpt_type=dispersed
<u>variation</u>	7904
	/frequency="0.05"
	/replace="c"
<u>repeat_region</u>	8108..8316
	/rpt_family="Alu"
	/rpt_type=dispersed
<u>variation</u>	8111
	/frequency="0.27"
	/replace="c"
<u>variation</u>	8288
	/frequency="0.07"
	/replace="a"
<u>variation</u>	8337
	/frequency="0.19"
	/replace="a"
<u>repeat_region</u>	8449..8518
	/rpt_family="Alu"
	/rpt_type=dispersed
<u>variation</u>	8680
	/frequency="0.12"
	/replace="a"
<u>variation</u>	8703
	/frequency="0.03"
	/replace="t"
<u>variation</u>	8790
	/frequency="0.01"
	/replace="t"
<u>variation</u>	9153
	/frequency="0.02"
	/replace="a"
<u>variation</u>	9596
	/frequency="0.03"
	/replace="t"
<u>variation</u>	9670
	/frequency="0.02"
	/replace="a"
<u>variation</u>	9680
	/frequency="0.31"
	/replace="g"

FIGURE 1

6/48

SEQ ID NO: 73:

BASE COUNT 2004 a 3117 c 2797 g 1885 t
 ORIGIN

```

 1 acacacctgtat tcccaccact ttgggaggct gaggcgggag gatgacctga gtcaggagt
 61 ttgagaccag cctggcaac atggcaaaac cctatctcta ctaaaaatac aaaaatagc
121 caggcatgtt ggccgggtgcc tgtaatccca gctactcagg aggctgaggc atgagaatca
181 cttgaacctg ggaggcggag gttacagtga gctgagatca caccactgca cccagcctg
241 ggtgacacag cgagactctg tctaaaaaa accaaaaacg agggccaggca cggtagctca
301 caccgtcat cccagcacat tgggaggccg aggccaggcg atcacgaatg caggagttcg
361 agaccagctt ggccaaacatg gtaagacccc gtctctacta aaaatacaa attagccggg
421 ttttgtggcg cacacctgtat atccccatg ttttttttt tgaggcgatg gaatcgctt
481 aaccggggag gtggagggtt cagttagctg agattgtgc attgtatcgat ccattgtact
541 ccaggctggg tgacagatgt agactcaatg cccaaaaaca aacaaacaaa aaacaaacaaa
601 aaaatgagaa aggctttac tctctgtttt cattgttgc tccccaatcat ctacgcgtt
661 ctgtctttt aatatctctg tctcccttt tctgtccctg gggcccttcc gtcctgtca
721 ctctgccccg tttttttttt tttttttttt tttttttttt ctgcggcatc ctctgtctca
781 gagttttttt gttttttttt tttttttttt tttttttttt tttttttttt caagtccctc
841 ctgtgttctt cttcccgatc tttttttttt tttttttttt acctctccct ctgtctccag
901 ggctgtttttt ctgtatccat tttttttttt tttttttttt tttttttttt tttttttttt
961 tggatctccg tttttttttt tttttttttt tttttttttt tttttttttt actctgttg tttttttttt
1021 tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt cttccctgtt ccaccccttcc
1081 agggccctgtt tttttttttt tttttttttt tttttttttt tttttttttt ttccgttcttc ctgcctccccc
1141 atctctctct tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt acagtcggc cccagcgctt
1201 gaggctgtttt tttttttttt tttttttttt tttttttttt tttttttttt gggacgcggaa tgaccccttcc
1261 agccctcttc tttttttttt tttttttttt tttttttttt tttttttttt ttccaaacttt tccttccgtt
1321 ccctctcttc tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
1381 ggcaggcagg tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
1441 gcccggcccg tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
1501 gcccgtgtt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
1561 gttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
1621 gggaaacccctt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
1681 gacagggagg tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
1741 gcacagagag tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
1801 cggcggagga tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
1861 ggcggcccgat tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
1921 gcaaggcccgat tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
1981 ccaaggcccgat tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
2041 aactqaggtt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
2101 ggaggagaga tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
2161 aggccggggat tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
2221 gggccggcccg tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
2281 ggttgggggg tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
2341 cagttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
2401 cgttggggcc tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
2461 tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
2521 gttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
2581 ccccccattttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
2641 cggcccgat tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
2701 gagggagagg tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
2761 taagacccatc tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
2821 gagaccaccc tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
2881 gttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
2941 ggagtccagg tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
3001 atccctgtttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
3061 gttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
3121 ctggacacca tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt
3181 cagttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt

```

FIGURE 1

7/48

3241 gaggagtctg cgggcagcca cttggagggg ttctgggatc tcaggtggca gagtgaggga
 3301 ggggaagagt tggggccctg gcgtggggga tggagggagc cccgaggtg ggcaggggcc
 3361 acetcacagc tttttccct gccagagggga caaattccca gctgacgggg accacaacct
 3421 gatcccttg cccaccctgg ccatgagtgc gggggcactg ggagctctac aggttaaggc
 3481 aaggagttgg gctggggaca aggtgggagg caggcagtga agggggcgaa gaggatgagg
 3541 ggcactggc ggggttctc tgatgtcccg gctctatccc cagctccag gtgtgtac
 3601 aaggctgcga gcggacctac tggcttaccc gcggcacgtg cagtggctgc gccgggcagg
 3661 tggcttcc ctgaagaccc tggagccca gctgggcacc ctgcaggccc gactggaccc
 3721 gctgtgcgc cggctgcagc tcctggatg tcctggcccc aagacctgac accccagacc
 3781 cccaccctg gccccaaaat cctgtggcct gaggccttga agcctgagac cccagacc
 3841 agtcaacag ccccgctctg agaccctgac accctaacag cccgctctg gaccctgaca
 3901 ccttaacagc cccgctctgaa gaccctgacc ctaacagtc tgctctgaga ccctgacc
 3961 gcatcccaa gatcgtgtgg ccctgagacc ctgaggccct agaccccaa atcctgecca
 4021 gaaacttcaa atttcaccc aagaccctgaa gactccatca tccatgaccc caaagtcccc
 4081 agatcccagc cccttaagacc caagacccca tcctgaagcc caaaggctt agaattcaaa
 4141 tcctcaccct aagacttgg aaccctggcc ccatgacatt gaaaaccatg gacccggca
 4201 ggcgtgggg ctcacgcctg taatcccagc actttgggag gccgaggca gtggatcacc
 4261 tgaggcggg agttcaagac cagccagacc aacatggta aaccctgtct ctactaaaaa
 4321 tacaaaatta gccaggcgtg gtgggtcatg cctgtaatcc cagctactt ggaggcttag
 4381 gcaggagaat cgcttgaacc tgggaggcgg aggttgcagt gagccgagat cgcaccatta
 4441 cactccagcc tggcaacaa gagcaaaact ccctctctct caaaaaaaaa aaaaaaaaaa
 4501 aaaagaagga aaagaaaaacc atggacccctc agaccctgag acccccagcc ccagccctga
 4561 gatcctgaca tcctaaagat cccaggccct aagatacaag accttgaccc aaagccagcc
 4621 ttgggacccct ggctgtacaa acccaagacc tccaggaccc agaccccgag ccctgaggcc
 4681 ctatgtctca ctcccaacat cggaaaccct gacacccctg atcctgagcc tgccctgt
 4741 cgactccaaag accctcactt ccaaagccag gcccaagcc ctgagaccag aagacttcaa
 4801 accctggc ttgggctaa ctccaaagac cctggatctc aaattccaa ttctagctct
 4861 gagactccag ccctcaccct ttagttccctg aacttgaacc cagagacccc atctctaaga
 4921 cttcagccctt gagatccagg gcctgaccct agactcgaccc ccacagaccc cagatactgt
 4981 ctgtaaaacc ccagctctgg tggggagcag tggctcaactc ctgtatccc aaggcagggg
 5041 aggccaaaggc agaaggaccc ttggggccca tgagttttag gacccctgg cagcatagca
 5101 agactcttt tccttaattat tattttttt attttttt ggagacagag tctcgcgctc
 5161 tggcccttgc gctagagtgc aatgggtccca ttccggcttgc ctggaaacctc cgcctctgg
 5221 gctcaagcga ttctccctgca tcagccctctt gatgtactgg gacttcagg gCACACTGCC
 5281 acacccggat aattttttt tatttttaga gacacagggt ttcaccgtgt tgccaggct
 5341 ggtcacaaaac tcctgagctc aggccatccg cccgcctcg cctcccaaaag cgctggata
 5401 acaggcgtga tccccggcgc ctggcttctt aatttttcta acaggccca caacaacaaa
 5461 aacccagtc tgagatccca gccccggcga ctctaaacagt cccaggcccg atccctcacc
 5521 tagaaccggag atgcctggat tgactccca gacttcaacc ccaaaaaaaa cactcagctc
 5581 tggaaaggcccg tcctgactcc agccatccatt ttcggaaaccc cacaggctga agactcccg
 5641 gcttaaacac ttccacccac gcggccacagt cccctgtga atatgcagcc cggattcagc
 5701 tgcagctca cagccacccct gcctgacc cccgtgtcac ccccttaccc tgcactcac
 5761 ctctcccttc cccacagatg tcccgcttgc ccctggccca gccacccccc gacccggcc
 5821 cggcccccgtt ggcggccccc tcctcagccct gggggggcat cagggccgcc cacggccatcc
 5881 tggggggggctt gcacccatc cttgacttgg ccgtgggggg actgtctgt ctgaagactc
 5941 ggctgtgacc cggggcccaa agccaccacc gtccctccaa agccagatct tattttat
 6001 ttatatttcac tactggggc gaaacagccca ggtgatcccc ccggcattat ctccccctag
 6061 ttagagacag tcctccgtg aggccctgggg ggcattctgtg ccttattttt acttatttt
 6121 ttcaggagca ggggtggggag gcagggtggac tcctgggtcc ccggaggagga gggactggg
 6181 tggccggatt ctgggtctc caagaagttt gtccacagac ttctggccctg gctttcccc
 6241 atctaggcct gggcaggaac atatattttt tatttaagca attactttt atgttgggg
 6301 gggggccggag gggaaaggga agcctgggtt tttgtacaaa aatgtgagaa acctttgtga
 6361 gacagagaac agggaaattaa atgtgtcata catatccact tgagggccat ttgtctgaga
 6421 gctggggctg gatgttggg taactggggc agggcagggtg gggggggagac ctccattcag
 6481 gtggaggtcc cgagtggccg gggcagccac tgggagatgg gtcgggtcacc cagacagctc
 6541 tgtggaggca gggctgagc ttggcttggg gcggccact gcataggcc gtttgttgt

FIGURE 1

8/48

```

6601 ttttgagat ggagtctcgc tctgttgccct aggctggagt gcagtgaggc aatctaaggt
6661 cactgcaacc tccacaccttccc gggttcaagc aattcttcctg cctcagcctc ccgatttagct
6721 gggatcacag gtgtgcacca ccatgccccag ctaattattt atttctttt tatttttagt
6781 agagacaggg tttcaccatg ttggccaggc tggtttcgaa ctccctgaccc caggtgatcc
6841 tcctgcctcg gcctcccaa gtgctggat tacaggtgtg agccaccaca cctgaccatc
6901 aggtcttcaa taaatatttata atggaaggtt ccacaagtca ccctgtgatc aacagtaccc
6961 gtatggaca aagctgcaag gtcaagatgg ttcattatgg ctgtgttcac catagcaaac
7021 tggaaacaat ctagatatcc aacagtgggg gtaagcaac atggtgcatc tgtggataga
7081 acgccaccca gcccggcga gcggggactg tcattcaggg aggctaagga gagaggctt
7141 cttggatata agaaagat cctgacatg gccaggcatg gtggctcaag cctgtaatcc
7201 tggcacttgc ggaggacgaa gcgggtggat cactgaagtc caagagtgg agaccggcct
7261 gcgagacatg gcaaaaaccct gtctaaaaaa agaaagaatg atgtcctgac atgaaacagc
7321 aggctacaaa accactgcat gctgtgatcc caattttgtg ttttcttca tatatatgg
7381 ttaaaacaaa aatcttaaag gggaaatacgc caaaatgtt acaatgactg tctccaggc
7441 aaaggagaga ggtgggattt tggtgactt ttaatgtgt tgattgtctg tattttacag
7501 aatttctgcc atgactgtgt attttgcattt acacattttt aaaaataataa acactatttt
7561 tagaataaca gaatatcagc ctccctcctt ccaaaaaataa gcccctagga gggacaaag
7621 ttgaccgctg attgagcctg tcagggctgt gcactaagtg tgggctttt acttacacaa
7681 tcctccttgc ctcttgcata cggccctgtt tacaggcggag ggaaactgag tctcagacaa
7741 ggagtggggc ctctgttgc caaagtccaca cagctaggaa gaggtggaa tgggattctg
7801 cgccgtgttgc ggcttccccc caaagcttc ttttgcaggc ggtgttggagg aatcctcgcc
7861 acatgcacac acatgagata tggagaaaca ggttcagtaa ggatttgggt ttttccagg
7921 gcctagagaa gggtaatgg cagagtaggg atgataattt aatgttta gttactttt
7981 cctttacaat aacccttgcata gacttccagg gggccctgtt cgtcaactgt ttgagtctgg
8041 gtttggaggt gcccatttcg gggccggagt ttttgcatttcc ccatcatagc cctcaagact
8101 ccaggcttgc tgggcccgggt ggctcaogcc ttttgcatttccca gcaacttggg aggtgaggc
8161 ggggtggatca ctttgcatttgc ggagttcaag gccagcctga ccaacatgaa gaaaccctgt
8221 ctctactaaa aatacaatcc agtacttcgg aaggctgggg caggagaatc gctcaaccc
8281 aggagacggg gtttgcgggtt agccggatc acatcacaaa cagccctagg cagtgccggg
8341 ccccccggcga ggctcagacc tggccctccaca gagctgtctg ggtgtatcg ttttcccggt
8401 ggaggccaggg ttttgcatttgc ccctggggc cccgcactgc taaggctgtt ttttgcgg
8461 atggagtttc gctctgttgc ctggctgtt gtcgtgtt gcaatctaag ctcaactgcct
8521 gggcaacaat agtggaaattt catctcaaaa aacaaaaaaac aaacaaacaa aacaaaaact
8581 ccaggctgttgc tccctggagg agaaggggc ccacagtccc cggagatgc ctggaaagagg
8641 cccctgtgttgc tccctgttgc tccctggagg ccacatggc cccatccccc cccagacccc
8701 tgctgtccac ccttgcaggc ccatggcggg gggccggatc tccctggatc gggcatctcc
8761 acgtctgttgc acgtgtatc ccaggccatc gtggatccccc acgggtcaag gtttgcggc
8821 cggggctgggg aggcttcac ccctggggc tgggtccata aaccatgttcc catccaccac
8881 agccaccatg atctggcttgc gaaacaggag gtgccttgc cccatccccc cccatccccc
8941 gtgggtccctt gtttgcgggg agtgcataaa gaccctccat aaggccatc acctgcccct
9001 ccgtccgcgtt cccatgttgc agatgttccat ttttgcaggc tccatccccc agtgcggccgg
9061 ggctgagagg gacagaggggg aagcaaggcc cccctgtgtt gggatcttgc agagggaaacg
9121 gatatttgc gtcactgtgtt gggggacatc caggaggaggt gtcaggctgtt gtttgcgg
9181 aggaaggaggt ggtccatgc cccttccttgc ggctggggc ggtgaccat caagggggcc
9241 cagtgttgcgtt gatccatcaca accaaccggc tggccatggg cgtggccgc tccatccccc
9301 gcctgggtttt gcctgacatc ttggctgttgc gccagccgc cgaggacagg gactgtcccg
9361 gcctcgtgttgc gaccagggttgc cccatccccc aacccttcgg cccatccccc cccatccccc
9421 gtcactgtgttgc cccttccttgc ccttccttgc gatgtatccccc ctggacccatc tccatccccc
9481 cgtccatgttgc ctcttcgttgc ggcgccttgc gtcgtgttgc gtcgtgttgc gccatgttgc
9541 cctggcccttgc gacggcccttgc acaacggatc gggccatccccc ttccactgtt gggatccccc
9601 catcaacccatc ctttgcaggatc cggccatccccc ctggacccatc aggaccacgc gacccatccccc
9661 cctggatatgc cccatgttgc aagccatgc ctccatccccc cacctgcagg tggatccccc
9721 gtcactgtgttgc ccaggccatc gcaaggccccc ggaaccctcc ggcagatcc agaggggact
9781 cgaccaagatc cccatccccc agg

```

//

FIGURE 1

Complete native human IL-11 -SEQ ID NO:1-:

1	11	21	31	41	51
1	MNCVCRIVLV	VLSLWPDTAV	APGPPPGFPR	VSPDPRAELD	STVLLTRSLL
61	RDKEPADGDH	NLDLSLPTLAM	SAGALGALQL	PGVLTRLRAD	LMSYLRHVQW
121	TLEPELGTLQ	ARLDRLRRL	QIIMSRALP	QPPFDPPAPP	LAPPSSAWGG
181	LHLTLDAVR	GLLLKTRL			IRAAHAILGG

Complete native macaque IL-11 (Macaca fascicularis) -SEQ ID NO:2-:

1	11	21	31	41	51
1	MNCVCRIVLV	VLSLWPDTAV	APGPPPGSPR	ASFPDPRAELD	STVLLTRSLL
61	RDKEPADGDH	NLDLSLPTLAM	SAGALGALQL	PSVLTRLRAD	LMSYLRHVQW
121	TLEPELGTLQ	TRLDRLRRL	QIIMSRALP	QLPFDPPAPP	LAPPSSAWGG
181	LHLTLDAVR	GLLLKTRL			IRAAHAILGG

Complete native mouse IL-11 (Mus musculus) -SEQ ID NO:3-:

1	11	21	31	41	51
1	MNCVCRIVLV	VLSLWPDRV	APGPPAGSPR	VSSDFRADLD	SAVLLTRSLL
61	RDKEPADGDH	SLDSLPTLAM	SAGTLLSSQL	PGVLTRLVD	LMSYFRHVQW
121	TLEPELGALQ	ARLERLRLRRL	QIIMSRALP	QAAPDQVIP	LRRAGGPSLK
181	LHLTLDAVR	GLLLKTRL			IRAAHAILGG

Complete native rat IL-11 (Rattus norvegicus) -SEQ ID NO:4-:

1	11	21	31	41	51
1	MNCVCRIVLV	VLSLWPDRV	APGPPAGSPR	VSSDFRADLD	SAVLLTRSLL
61	RDKEPADGDH	NLDLSLPTLAM	SAGTLLSSQL	PGVLTRLVD	LMSYFRHVQW
121	TLEPELGALQ	ARLERLRLRRL	QIIMSRALP	QAAPDQPAVP	LRRAAGPSLK
181	LHLTLDAVR	GLLLKTRL			IRAAHAILGG

FIGURE 2

10/48

Native human IL-11 deleted from the 34 first aminoacids -SEQ ID NO :5- :

PRAELD STVLLTRSLL ADTRQLAAQL RDKFPADGDH NLDSLPTLAM
SAGALGALQL PGVLTRLRAD LLSYLRHVQW LRRAGGSSLK TLEPELGTLQ
ARLDRLRLRL QLLMSRLALP QPPPDPAPP LAPPSSAWGG IRAAHAILGG
LHHTLDWAVR GLLLLKTRL

Native macaque IL-11 deleted from the 34 first aminoacids -SEQ ID NO:6- :

PRAELD STVLLTRSLL EDTRQLTIQL KDKFPADGDH NLDSLPTLAM
SAGALGALQL PSVLTRLRAD LLSYLRHVQW LRRAMGSSLK TLEPELGTLQ
TRLDRRLRL QLLMSRLALP QLPPDPAPP LAPPSSTWGG IRAAHAILGG
LHHTLDWAVR GLLLLKTRL

Native mouse IL-11 deleted from the 34 first aminoacids -SEQ ID NO:7- :

PRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH SLDSLPTLAM
SAGTLGSQLQ PGVLTRLRVD LMSYLRHVQW LRRAGGPSLK TLEPELGALQ
ARLERLLRL QLLMSRLALP QAAPDQPVIP LGPPASAWGS IRAAHAILGG
LHHTLDWAVR GLLLLKTRL

Native rat IL-11 deleted from the 34 first aminoacids -SEQ ID NO:8- :

PRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH NLDSLPTLAM
SAGTLGSQLQ PGVLTRLRVD LMSYFRHVQW LRRAAGPSLK TLEPELGALQ
ARLERLLRL QLLMSRLALP QAAPDQPAVP LGPPASAWGS IRAAHAILGG
LHHTLDWAVR GLLLLKTRL

FIGURE 3

11/48

hIL-11 mutein deriving from 34aa-deleted native human hIL-11 -SEQ ID NO :9-:

PRAELDSTVLLTRSLLADTRQLAAQLRDKFPADGDHNLDLPTLAMSAGALGA
 LQLPGVLTRLRADLLSYLRHVQWLRRAGGSSLKTLEPELGLTLQARLDRLRL
 QLLMSRLALPQPPPDPPAPPLAPPSSAWGGIRAAHAILGGX₁LTX₂WAVRGLL
 LKTRL wherein X₁ and X₂ are chosen from the group comprising :

- Alanine (A),
- Valine (V),
- Leucine (L),
- Isoleucine (I),
- Phenylalanine (F),
- Methionine (M),
- Proline (P),
- Tryptophan (W).

hIL-11 mutein deriving from 34aa-deleted native human hIL-11 -SEQ ID NO :10-:

PRAELDSTVLLTRSLLADTRQLAAQLRDKFPADGDHNLDLPTLAMSAGALGA
 LQLPGVLTRLRADLLSYLRHVQWLRRAGGSSLKTLEPELGLTLQARLDRLRL
 QLLMSRLALPQPPPDPPAPPLAPPSSAWGGIRAAHAILGGVLTLWAVRGLL
 LKTRL

hIL-11 mutein deriving from 34aa-deleted native human hIL-11 -SEQ ID NO :11-:

PRAELDSTVLLTRSLLADTRQLAAQLRDKFPADGDHNLDLPTLAMSAGALGA
 LQLPGVLTRLRADLLSYLRHVQWLRRAGGSSLKTLEPELGLTLQARLDRLRL
 QLLMSRLALPQPPPDPPAPPLAPPSSAWGGIRAAHAILGGALTLYWAVRGLL
 LKTRL

hIL-11 mutein deriving from 34aa-deleted native human hIL-11 -SEQ ID NO :12-:

PRAELDSTVLLTRSLLADTRQLAAQLRDKFPADGDHNLDLPTLAMSAGALGA
 LQLPGVLTRLRADLLSYLRHVQWLRRAGGSSLKTLEPELGLTLQARLDRLRL
 QLLMSRLALPQPPPDPPAPPLAPPSSAWGGIRAAHAILGGVLTLWAVRGLL
 LKTRL

hIL-11 mutein deriving from 34aa-deleted native human hIL-11 -SEQ ID NO :13-:

PRAELDSTVLLTRSLLADTRQLAAQLRDKFPADGDHNLDLPTLAMSAGALGA
 LQLPGVLTRLRADLLSYLRHVQWLRRAGGSSLKTLEPELGLTLQARLDRLRL
 QLLMSRLALPQPPPDPPAPPLAPPSSAWGGIRAAHAILGGALTLWAVRGLL
 LKTRL

FIGURE 4

12/48

hIL-11 mutein deriving from 21aa-deleted native human hIL-11 -SEQ ID NO :14-:

PGPPPGPPRVSPDPRAELDSTVLLTRSLLADTRQLAAQLRDKFPADGDHNLDL
 PTLAMSAGALGALQLPGVLTRLRADLLSYLRHVQWLRRAGGSSLKTLEPELGT
 LQARLDRLRLQQLMSRLALPQPPPDPPAPPLAPPSSAWGGIRAAHAILGGLX₁
LTX₂WAVRGLLLLKTRL

wherein X₁ and X₂ are chosen from the group comprising :

- Alanine (A),
- Valine (V),
- Leucine (L),
- Isoleucine (I),
- Phenylalanine (F),
- Methionine (M),
- Proline (P),
- Tryptophan (W).

hIL-11 mutein deriving from 21aa-deleted native human hIL-11 -SEQ ID NO :15-:

PGPPPGPPRVSPDPRAELDSTVLLTRSLLADTRQLAAQLRDKFPADGDHNLDL
 PTLAMSAGALGALQLPGVLTRLRADLLSYLRHVQWLRRAGGSSLKTLEPELGT
 LQARLDRLRLQQLMSRLALPQPPPDPPAPPLAPPSSAWGGIRAAHAILGGLY
TLAWAVRGLLLLKTRL

hIL-11 mutein deriving from 21aa-deleted native human hIL-11 -SEQ ID NO :16-:

PGPPPGPPRVSPDPRAELDSTVLLTRSLLADTRQLAAQLRDKFPADGDHNLDL
 PTLAMSAGALGALQLPGVLTRLRADLLSYLRHVQWLRRAGGSSLKTLEPELGT
 LQARLDRLRLQQLMSRLALPQPPPDPPAPPLAPPSSAWGGIRAAHAILGGLAL
TLYWAVRGLLLLKTRL

hIL-11 mutein deriving from 21aa-deleted native human hIL-11 -SEQ ID NO :17-:

PGPPPGPPRVSPDPRAELDSTVLLTRSLLADTRQLAAQLRDKFPADGDHNLDL
 PTLAMSAGALGALQLPGVLTRLRADLLSYLRHVQWLRRAGGSSLKTLEPELGT
 LQARLDRLRLQQLMSRLALPQPPPDPPAPPLAPPSSAWGGIRAAHAILGGLVL
TLVWAVRGLLLLKTRL

hIL-11 mutein deriving from 21aa-deleted native human hIL-11 -SEQ ID NO :18-:

PGPPPGPPRVSPDPRAELDSTVLLTRSLLADTRQLAAQLRDKFPADGDHNLDL
 PTLAMSAGALGALQLPGVLTRLRADLLSYLRHVQWLRRAGGSSLKTLEPELGT
 LQARLDRLRLQQLMSRLALPQPPPDPPAPPLAPPSSAWGGIRAAHAILGGLAL
TLAWAVRGLLLLKTRL

FIGURE 5

hIL-11 mutein deriving from complete native human hIL-11 -SEQ ID NO :19:-

MNCVCR_LVV_VLSLWPDTAVAPG_{PPP}G_{PPR}VSPD_PR_AE_LD_ST_VL_TR_SL_LA_DTR
 QLAAQLRD_KF_AD_GD_HN_LD_SL_PT_LA_MS_AG_AL_GA_LQ_LP_GV_LT_RL_RA_DL_LS_YL_RH
 VQWLRRAGGSSLK_TL_EP_EL_GT_LQ_AR_LD_R_LR_RL_QL_LM_SR_LA_LP_QP_PP_DP_PA_PPL
 APPSSAWGGIRAAHAILGG_LX₁L_TL_X₂WA_VR_GL_LL_KT_RL

wherein X₁ and X₂ are chosen from the group comprising :

- Alanine (A),
- Valine (V),
- Leucine (L),
- Isoleucine (I),
- Phenylalanine (F),
- Methionine (M),
- Proline (P),
- Tryptophan (W).

hIL-11 mutein deriving from complete native human hIL-11 -SEQ ID NO :20:-

MNCVCR_LVV_VLSLWPDTAVAPG_{PPP}G_{PPR}VSPD_PR_AE_LD_ST_VL_TR_SL_LA_DTR
 QLAAQLRD_KF_AD_GD_HN_LD_SL_PT_LA_MS_AG_AL_GA_LQ_LP_GV_LT_RL_RA_DL_LS_YL_RH
 VQWLRRAGGSSLK_TL_EP_EL_GT_LQ_AR_LD_R_LR_RL_QL_LM_SR_LA_LP_QP_PP_DP_PA_PPL
 APPSSAWGGIRAAHAILGG_LV_LT_AWA_VR_GL_LL_KT_RL

hIL-11 mutein deriving from complete native human hIL-11 -SEQ ID NO :21:-

MNCVCR_LVV_VLSLWPDTAVAPG_{PPP}G_{PPR}VSPD_PR_AE_LD_ST_VL_TR_SL_LA_DTR
 QLAAQLRD_KF_AD_GD_HN_LD_SL_PT_LA_MS_AG_AL_GA_LQ_LP_GV_LT_RL_RA_DL_LS_YL_RH
 VQWLRRAGGSSLK_TL_EP_EL_GT_LQ_AR_LD_R_LR_RL_QL_LM_SR_LA_LP_QP_PP_DP_PA_PPL
 APPSSAWGGIRAAHAILGG_LA_LT_LV_VWA_VR_GL_LL_KT_RL

hIL-11 mutein deriving from complete native human hIL-11 -SEQ ID NO :22:-

MNCVCR_LVV_VLSLWPDTAVAPG_{PPP}G_{PPR}VSPD_PR_AE_LD_ST_VL_TR_SL_LA_DTR
 QLAAQLRD_KF_AD_GD_HN_LD_SL_PT_LA_MS_AG_AL_GA_LQ_LP_GV_LT_RL_RA_DL_LS_YL_RH
 VQWLRRAGGSSLK_TL_EP_EL_GT_LQ_AR_LD_R_LR_RL_QL_LM_SR_LA_LP_QP_PP_DP_PA_PPL
 APPSSAWGGIRAAHAILGG_LV_LT_LV_VWA_VR_GL_LL_KT_RL

hIL-11 mutein deriving from complete native human hIL-11 -SEQ ID NO :23:-

MNCVCR_LVV_VLSLWPDTAVAPG_{PPP}G_{PPR}VSPD_PR_AE_LD_ST_VL_TR_SL_LA_DTR
 QLAAQLRD_KF_AD_GD_HN_LD_SL_PT_LA_MS_AG_AL_GA_LQ_LP_GV_LT_RL_RA_DL_LS_YL_RH
 VQWLRRAGGSSLK_TL_EP_EL_GT_LQ_AR_LD_R_LR_RL_QL_LM_SR_LA_LP_QP_PP_DP_PA_PPL
 APPSSAWGGIRAAHAILGG_LA_LT_LA_AWA_VR_GL_LL_KT_RL

IL-11 mutein deriving from 34aa-deleted native macaque IL-11 -SEQ ID NO:24- :

PRAELD STVLLTRSLL EDTRQLTIQL KDKFPADGDH NLDSLPTLAM
 SAGALGALQL PSVLTRLRAD LLSYLRHVQW LRRAMGSSLK TLEPELGLTQ
 TRLDRLRLRL QLLMSRLALP QLPPDPPAPP LAPPSSTWGG
 IRAAHAILGG LX₁LTX₂WAVR GLLLLKTRL

wherein X₁ and X₂ are chosen from the group comprising :

- Alanine (A),
- Valine (V),
- Leucine (L),
- Isoleucine (I),
- Phenylalanine (F),
- Methionine (M),
- Proline (P),
- Tryptophan (W).

IL-11 mutein deriving from 34aa-deleted native macaque IL-11 -SEQ ID NO:25- :

PRAELD STVLLTRSLL EDTRQLTIQL KDKFPADGDH NLDSLPTLAM
 SAGALGALQL PSVLTRLRAD LLSYLRHVQW LRRAMGSSLK TLEPELGLTQ
 TRLDRLRLRL QLLMSRLALP QLPPDPPAPP LAPPSSTWGG
 IRAAHAILGG LYLTLAWAVR GLLLLKTRL

IL-11 mutein deriving from 34aa-deleted native macaque IL-11 -SEQ ID NO:26- :

PRAELD STVLLTRSLL EDTRQLTIQL KDKFPADGDH NLDSLPTLAM
 SAGALGALQL PSVLTRLRAD LLSYLRHVQW LRRAMGSSLK TLEPELGLTQ
 TRLDRLRLRL QLLMSRLALP QLPPDPPAPP LAPPSSTWGG
 IRAAHAILGG LALTLYWAVR GLLLLKTRL

IL-11 mutein deriving from 34aa-deleted native macaque IL-11 -SEQ ID NO:27- :

PRAELD STVLLTRSLL EDTRQLTIQL KDKFPADGDH NLDSLPTLAM
 SAGALGALQL PSVLTRLRAD LLSYLRHVQW LRRAMGSSLK TLEPELGLTQ
 TRLDRLRLRL QLLMSRLALP QLPPDPPAPP LAPPSSTWGG
 IRAAHAILGG LYLTLYWAVR GLLLLKTRL

IL-11 mutein deriving from 34aa-deleted native macaque IL-11 -SEQ ID NO:28- :

PRAELD STVLLTRSLL EDTRQLTIQL KDKFPADGDH NLDSLPTLAM
 SAGALGALQL PSVLTRLRAD LLSYLRHVQW LRRAMGSSLK TLEPELGLTQ
 TRLDRLRLRL QLLMSRLALP QLPPDPPAPP LAPPSSTWGG
 IRAAHAILGG LALTLAWAVR GLLLLKTRL

FIGURE 7

IL-11 mutein deriving from 21aa-deleted native macaque IL-11 -SEQ ID NO:29- :

PGPPPGSPR ASPDPRAELD STVLLTRSLL EDTRQLTIQL KDKFPADGDH
 NLDSLPTLAM SAGALGALQL PSVLTRLRAD LLSYLRHVQW LRRAMGSSLK
 TLEPELGTQ TRLDRLRLRRL QLLMSRLALP QLPPDPPAPP
 LAPPSSTWGG IRAAHAILGG LX₁LTX₂WAVR GLLLLKTRL
 wherein X₁ and X₂ are chosen from the group comprising :

- Alanine (A),
- Valine (V),
- Leucine (L),
- Isoleucine (I),
- Phenylalanine (F),
- Methionine (M),
- Proline (P),
- Tryptophan (W).

IL-11 mutein deriving from 21aa-deleted native macaque IL-11 -SEQ ID NO:30- :

PGPPPGSPR ASPDPRAELD STVLLTRSLL EDTRQLTIQL KDKFPADGDH
 NLDSLPTLAM SAGALGALQL PSVLTRLRAD LLSYLRHVQW LRRAMGSSLK
 TLEPELGTQ TRLDRLRLRRL QLLMSRLALP QLPPDPPAPP
 LAPPSSTWGG IRAAHAILGG LVLTLWAVR GLLLLKTRL

IL-11 mutein deriving from 21aa-deleted native macaque IL-11 -SEQ ID NO:31- :

PGPPPGSPR ASPDPRAELD STVLLTRSLL EDTRQLTIQL KDKFPADGDH
 NLDSLPTLAM SAGALGALQL PSVLTRLRAD LLSYLRHVQW LRRAMGSSLK
 TLEPELGTQ TRLDRLRLRRL QLLMSRLALP QLPPDPPAPP
 LAPPSSTWGG IRAAHAILGG LALTLYWAVR GLLLLKTRL

IL-11 mutein deriving from 21aa-deleted native macaque IL-11 -SEQ ID NO:32- :

PGPPPGSPR ASPDPRAELD STVLLTRSLL EDTRQLTIQL KDKFPADGDH
 NLDSLPTLAM SAGALGALQL PSVLTRLRAD LLSYLRHVQW LRRAMGSSLK
 TLEPELGTQ TRLDRLRLRRL QLLMSRLALP QLPPDPPAPP
 LAPPSSTWGG IRAAHAILGG LYLTLYWAVR GLLLLKTRL

IL-11 mutein deriving from 21aa-deleted native macaque IL-11 -SEQ ID NO:33- :

PGPPPGSPR ASPDPRAELD STVLLTRSLL EDTRQLTIQL KDKFPADGDH
 NLDSLPTLAM SAGALGALQL PSVLTRLRAD LLSYLRHVQW LRRAMGSSLK
 TLEPELGTQ TRLDRLRLRRL QLLMSRLALP QLPPDPPAPP
 LAPPSSTWGG IRAAHAILGG LALTLYWAVR GLLLLKTRL

FIGURE 8

IL-11 mutein deriving from complete native macaque IL-11 -SEQ ID NO:34- :

MNCVCRLVLV VSLWPDTAV APGPPPGSPR ASPDPRAELD STVLLTRSLL
 EDTRQLTIQL KDKFPADGDH NLDSLPTLAM SAGALGALQL PSVLTRLRAD
 LLSYLRHVQW LRRAMGSSLK TLEPELGLQ TRLDRLLLRRL QLLMSRLALP
 QLPPDPPAPP LAPPSSTWGG IRAAHAILGG LX₁LTX₂WAVR
 GLLLLKTRL

wherein X₁ and X₂ are chosen from the group comprising :

- Alanine (A),
- Valine (V),
- Leucine (L),
- Isoleucine (I),
- Phenylalanine (F),
- Methionine (M),
- Proline (P),
- Tryptophan (W).

IL-11 mutein deriving from complete native macaque IL-11 -SEQ ID NO:35- :

MNCVCRLVLV VSLWPDTAV APGPPPGSPR ASPDPRAELD STVLLTRSLL
 EDTRQLTIQL KDKFPADGDH NLDSLPTLAM SAGALGALQL PSVLTRLRAD
 LLSYLRHVQW LRRAMGSSLK TLEPELGLQ TRLDRLLLRRL QLLMSRLALP
 QLPPDPPAPP LAPPSSTWGG IRAAHAILGG LVLTLWAVR GLLLLKTRL

IL-11 mutein deriving from complete native macaque IL-11 -SEQ ID NO:36- :

MNCVCRLVLV VSLWPDTAV APGPPPGSPR ASPDPRAELD STVLLTRSLL
 EDTRQLTIQL KDKFPADGDH NLDSLPTLAM SAGALGALQL PSVLTRLRAD
 LLSYLRHVQW LRRAMGSSLK TLEPELGLQ TRLDRLLLRRL QLLMSRLALP
 QLPPDPPAPP LAPPSSTWGG IRAAHAILGG LALTLYWAVR GLLLLKTRL

IL-11 mutein deriving from complete native macaque IL-11 -SEQ ID NO:37- :

MNCVCRLVLV VSLWPDTAV APGPPPGSPR ASPDPRAELD STVLLTRSLL
 EDTRQLTIQL KDKFPADGDH NLDSLPTLAM SAGALGALQL PSVLTRLRAD
 LLSYLRHVQW LRRAMGSSLK TLEPELGLQ TRLDRLLLRRL QLLMSRLALP
 QLPPDPPAPP LAPPSSTWGG IRAAHAILGG LYLTYWAVR GLLLLKTRL

IL-11 mutein deriving from complete native macaque IL-11 -SEQ ID NO:38- :

MNCVCRLVLV VSLWPDTAV APGPPPGSPR ASPDPRAELD STVLLTRSLL
 EDTRQLTIQL KDKFPADGDH NLDSLPTLAM SAGALGALQL PSVLTRLRAD
 LLSYLRHVQW LRRAMGSSLK TLEPELGLQ TRLDRLLLRRL QLLMSRLALP
 QLPPDPPAPP LAPPSSTWGG IRAAHAILGG LALTLWAVR GLLLLKTRL

FIGURE 9

IL-11 mutein deriving from 34aa-deleted native mouse IL-11 -SEQ ID NO:39- :

PRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH SLDSLPTLAM
 SAGTLGSQLQ PGVLTRLRVD LMSYLRHVQW LRRAGGPSLK TLEPELGALQ
 ARLERLLRRL QLLMSRLALP QAAPDQPVIP LGPPASAWGS IRAAHAILGG
LX₁LTX₂WAVR GLLLLKTRL

wherein X₁ and X₂ are chosen from the group comprising :

- Alanine (A),
- Valine (V),
- Leucine (L),
- Isoleucine (I),
- Phenylalanine (F),
- Methionine (M),
- Proline (P),
- Tryptophan (W).

IL-11 mutein deriving from 34aa-deleted native mouse IL-11 -SEQ ID NO:40- :

PRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH SLDSLPTLAM
 SAGTLGSQLQ PGVLTRLRVD LMSYLRHVQW LRRAGGPSLK TLEPELGALQ
 ARLERLLRRL QLLMSRLALP QAAPDQPVIP LGPPASAWGS IRAAHAILGG
LYLTLWAVR GLLLLKTRL

IL-11 mutein deriving from 34aa-deleted native mouse IL-11 -SEQ ID NO:41- :

PRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH SLDSLPTLAM
 SAGTLGSQLQ PGVLTRLRVD LMSYLRHVQW LRRAGGPSLK TLEPELGALQ
 ARLERLLRRL QLLMSRLALP QAAPDQPVIP LGPPASAWGS IRAAHAILGG
LALTLYWAVR GLLLLKTRL

IL-11 mutein deriving from 34aa-deleted native mouse IL-11 -SEQ ID NO:42- :

PRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH SLDSLPTLAM
 SAGTLGSQLQ PGVLTRLRVD LMSYLRHVQW LRRAGGPSLK TLEPELGALQ
 ARLERLLRRL QLLMSRLALP QAAPDQPVIP LGPPASAWGS IRAAHAILGG
LYLTLWAVR GLLLLKTRL

IL-11 mutein deriving from 34aa-deleted native mouse IL-11 -SEQ ID NO:43- :

PRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH SLDSLPTLAM
 SAGTLGSQLQ PGVLTRLRVD LMSYLRHVQW LRRAGGPSLK TLEPELGALQ
 ARLERLLRRL QLLMSRLALP QAAPDQPVIP LGPPASAWGS IRAAHAILGG
LALTLYWAVR GLLLLKTRL

18/48

IL-11 mutein deriving from 21aa-deleted native mouse IL-11 -SEQ ID NO:44- :

PGPPAGSPR VSSDPRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH
 SLDSLPTLAM SAGTLGSQLQ PGVLTRLRVD LMSYLRHVQW LRRAGGPSLK
 TLEPELGALQ ARLERLLRRL QLLMSRLALP QAAPDQPVIP LGPPASAWGS
 IRAAHAILGG LX₁LTX₂WAVR GLLLLKTRL

wherein X₁ and X₂ are chosen from the group comprising :

- Alanine (A),
- Valine (V),
- Leucine (L),
- Isoleucine (I),
- Phenylalanine (F),
- Methionine (M),
- Proline (P),
- Tryptophan (W).

IL-11 mutein deriving from 21aa-deleted native mouse IL-11 -SEQ ID NO:45- :

PGPPAGSPR VSSDPRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH
 SLDSLPTLAM SAGTLGSQLQ PGVLTRLRVD LMSYLRHVQW LRRAGGPSLK
 TLEPELGALQ ARLERLLRRL QLLMSRLALP QAAPDQPVIP LGPPASAWGS
 IRAAHAILGG LVLTAWAVR GLLLLKTRL

IL-11 mutein deriving from 21aa-deleted native mouse IL-11 -SEQ ID NO:46- :

PGPPAGSPR VSSDPRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH
 SLDSLPTLAM SAGTLGSQLQ PGVLTRLRVD LMSYLRHVQW LRRAGGPSLK
 TLEPELGALQ ARLERLLRRL QLLMSRLALP QAAPDQPVIP LGPPASAWGS
 IRAAHAILGG LALTLVWAVR GLLLLKTRL

IL-11 mutein deriving from 21aa-deleted native mouse IL-11 -SEQ ID NO:47- :

PGPPAGSPR VSSDPRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH
 SLDSLPTLAM SAGTLGSQLQ PGVLTRLRVD LMSYLRHVQW LRRAGGPSLK
 TLEPELGALQ ARLERLLRRL QLLMSRLALP QAAPDQPVIP LGPPASAWGS
 IRAAHAILGG LVLTLVWAVR GLLLLKTRL

IL-11 mutein deriving from 21aa-deleted native mouse IL-11 -SEQ ID NO:48- :

PGPPAGSPR VSSDPRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH
 SLDSLPTLAM SAGTLGSQLQ PGVLTRLRVD LMSYLRHVQW LRRAGGPSLK
 TLEPELGALQ ARLERLLRRL QLLMSRLALP QAAPDQPVIP LGPPASAWGS
 IRAAHAILGG LALTLAWAVR GLLLLKTRL

FIGURE 11

19/48

IL-11 mutein deriving from complete native mouse IL-11 -SEQ ID NO:49- :

MNCVCR₁LVL VLSLWPDRVV APGPPAGSPR VSSDPRADLD SAVLLTRSLL
 ADTRQLAAQM RD₂KFPADGDH SLDSLPTLAM SAGTLGSQLQ PGVLTRLRVD
 LMSYLRHVQW LRRAGGPSLK TLEPELGALQ ARLERLLRRL QLLMSRLALP
 QAAPDQPVIP LGPPASAWGS IRAAHAILGG LX₁LTX₂WAVR
 GLLLLKTRL

wherein X₁ and X₂ are chosen from the group comprising :

- Alanine (A),
- Valine (V),
- Leucine (L),
- Isoleucine (I),
- Phenylalanine (F),
- Methionine (M),
- Proline (P),
- Tryptophan (W).

IL-11 mutein deriving from complete native mouse IL-11 -SEQ ID NO:50- :

MNCVCR₁LVL VLSLWPDRVV APGPPAGSPR VSSDPRADLD SAVLLTRSLL
 ADTRQLAAQM RD₂KFPADGDH SLDSLPTLAM SAGTLGSQLQ PGVLTRLRVD
 LMSYLRHVQW LRRAGGPSLK TLEPELGALQ ARLERLLRRL QLLMSRLALP
 QAAPDQPVIP LGPPASAWGS IRAAHAILGG LVLTLWAVR GLLLLKTRL

IL-11 mutein deriving from complete native mouse IL-11 -SEQ ID NO:51- :

MNCVCR₁LVL VLSLWPDRVV APGPPAGSPR VSSDPRADLD SAVLLTRSLL
 ADTRQLAAQM RD₂KFPADGDH SLDSLPTLAM SAGTLGSQLQ PGVLTRLRVD
 LMSYLRHVQW LRRAGGPSLK TLEPELGALQ ARLERLLRRL QLLMSRLALP
 QAAPDQPVIP LGPPASAWGS IRAAHAILGG LALTLYWAVR GLLLLKTRL

IL-11 mutein deriving from complete native mouse IL-11 -SEQ ID NO:52- :

MNCVCR₁LVL VLSLWPDRVV APGPPAGSPR VSSDPRADLD SAVLLTRSLL
 ADTRQLAAQM RD₂KFPADGDH SLDSLPTLAM SAGTLGSQLQ PGVLTRLRVD
 LMSYLRHVQW LRRAGGPSLK TLEPELGALQ ARLERLLRRL QLLMSRLALP
 QAAPDQPVIP LGPPASAWGS IRAAHAILGG LVLTLWAVR GLLLLKTRL

IL-11 mutein deriving from complete native mouse IL-11 -SEQ ID NO:53- :

MNCVCR₁LVL VLSLWPDRVV APGPPAGSPR VSSDPRADLD SAVLLTRSLL
 ADTRQLAAQM RD₂KFPADGDH SLDSLPTLAM SAGTLGSQLQ PGVLTRLRVD
 LMSYLRHVQW LRRAGGPSLK TLEPELGALQ ARLERLLRRL QLLMSRLALP
 QAAPDQPVIP LGPPASAWGS IRAAHAILGG LALTLWAVR GLLLLKTRL

FIGURE 12

IL-11 mutein deriving from 34aa-deleted native rat IL-11 -SEQ ID NO:54- :

PRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH NLDSLPTLAM
 SAGTLGSQLQ PGVLTRLRVD LMSYFRHVQW LRRAAGPSLK TLEPELGALQ
 ARLERLLRRL QLLMSRLALP QAAPDQPAVP LGPPASAWGS IRAAHAILGG
LX₁LTX₂WAVR GLLLLKTRL

wherein X₁ and X₂ are chosen from the group comprising :

- Alanine (A),
- Valine (V),
- Leucine (L),
- Isoleucine (I),
- Phenylalanine (F),
- Methionine (M),
- Proline (P),
- Tryptophan (W).

IL-11 mutein deriving from 34aa-deleted native rat IL-11 -SEQ ID NO:55- :

PRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH NLDSLPTLAM
 SAGTLGSQLQ PGVLTRLRVD LMSYFRHVQW LRRAAGPSLK TLEPELGALQ
 ARLERLLRRL QLLMSRLALP QAAPDQPAVP LGPPASAWGS IRAAHAILGG
LVLTLAWAVR GLLLLKTRL

IL-11 mutein deriving from 34aa-deleted native rat IL-11 -SEQ ID NO:56- :

PRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH NLDSLPTLAM
 SAGTLGSQLQ PGVLTRLRVD LMSYFRHVQW LRRAAGPSLK TLEPELGALQ
 ARLERLLRRL QLLMSRLALP QAAPDQPAVP LGPPASAWGS IRAAHAILGG
LALTLYWAVR GLLLLKTRL

IL-11 mutein deriving from 34aa-deleted native rat IL-11 -SEQ ID NO:57- :

PRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH NLDSLPTLAM
 SAGTLGSQLQ PGVLTRLRVD LMSYFRHVQW LRRAAGPSLK TLEPELGALQ
 ARLERLLRRL QLLMSRLALP QAAPDQPAVP LGPPASAWGS IRAAHAILGG
LVLTLVWAVR GLLLLKTRL

IL-11 mutein deriving from 34aa-deleted native rat IL-11 -SEQ ID NO:58- :

PRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH NLDSLPTLAM
 SAGTLGSQLQ PGVLTRLRVD LMSYFRHVQW LRRAAGPSLK TLEPELGALQ
 ARLERLLRRL QLLMSRLALP QAAPDQPAVP LGPPASAWGS IRAAHAILGG
LALTLAWAVR GLLLLKTRL

IL-11 mutein deriving from 21aa-deleted native rat IL-11 -SEQ ID NO:59- :

PGPPAGSPR VSSDPRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH
 NLDSLPTLAM SAGTLGSQLQ PGVLTRLRVD LMSYFRHVQW LRRAAGPSLK
 TLEPELGALQ ARLERLLRRRL QLLMSRLALP QAAPDQPAVP LGPPASAWGS
 IRAAHAILGG LX₁LTX₂WAVR GLLLLKTRL

wherein X₁ and X₂ are chosen from the group comprising :

- Alanine (A),
- Valine (V),
- Leucine (L),
- Isoleucine (I),
- Phenylalanine (F),
- Methionine (M),
- Proline (P),
- Tryptophan (W).

IL-11 mutein deriving from 21aa-deleted native rat IL-11 -SEQ ID NO:60- :

PGPPAGSPR VSSDPRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH
 NLDSLPTLAM SAGTLGSQLQ PGVLTRLRVD LMSYFRHVQW LRRAAGPSLK
 TLEPELGALQ ARLERLLRRRL QLLMSRLALP QAAPDQPAVP LGPPASAWGS
 IRAAHAILGG LYLTLAWAVR GLLLLKTRL

IL-11 mutein deriving from 21aa-deleted native rat IL-11 -SEQ ID NO:61- :

PGPPAGSPR VSSDPRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH
 NLDSLPTLAM SAGTLGSQLQ PGVLTRLRVD LMSYFRHVQW LRRAAGPSLK
 TLEPELGALQ ARLERLLRRRL QLLMSRLALP QAAPDQPAVP LGPPASAWGS
 IRAAHAILGG LALTLYWAVR GLLLLKTRL

IL-11 mutein deriving from 21aa-deleted native rat IL-11 -SEQ ID NO:62- :

PGPPAGSPR VSSDPRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH
 NLDSLPTLAM SAGTLGSQLQ PGVLTRLRVD LMSYFRHVQW LRRAAGPSLK
 TLEPELGALQ ARLERLLRRRL QLLMSRLALP QAAPDQPAVP LGPPASAWGS
 IRAAHAILGG LYLTLYWAVR GLLLLKTRL

IL-11 mutein deriving from 21aa-deleted native rat IL-11 -SEQ ID NO:63- :

PGPPAGSPR VSSDPRADLD SAVLLTRSLL ADTRQLAAQM RDKFPADGDH
 NLDSLPTLAM SAGTLGSQLQ PGVLTRLRVD LMSYFRHVQW LRRAAGPSLK
 TLEPELGALQ ARLERLLRRRL QLLMSRLALP QAAPDQPAVP LGPPASAWGS
 IRAAHAILGG LALTLAWAVR GLLLLKTRL

FIGURE 14

IL-11 mutein deriving from complete native rat IL-11 -SEQ ID NO:64- :

MNCVCR₁LV₂ VSLWPDRVV APGPPAGSPR VSSDPRADLD SAVLLTRSLL
 ADTRQLAAQM RDKFPADGDH NLD₃LPTLAM SAGTLGSQLQ PGVLTRLRVD
 LMSYFRHVQW LRRAAGPSLK TLEPELGALQ ARLERLLRRL QLLMSRLALP
 QAAPDQPAVP LGPPASA₅WGS IRAAHAILGG X₁X₂WAVR GLLLKTRL
 wherein X₁ and X₂ are chosen from the group comprising :

- Alanine (A),
- Valine (V),
- Leucine (L),
- Isoleucine (I),
- Phenylalanine (F),
- Methionine (M),
- Proline (P),
- Tryptophan (W).

IL-11 mutein deriving from complete native rat IL-11 -SEQ ID NO:65- :

MNCVCR₁LV₂ VSLWPDRVV APGPPAGSPR VSSDPRADLD SAVLLTRSLL
 ADTRQLAAQM RDKFPADGDH NLD₃LPTLAM SAGTLGSQLQ PGVLTRLRVD
 LMSYFRHVQW LRRAAGPSLK TLEPELGALQ ARLERLLRRL QLLMSRLALP
 QAAPDQPAVP LGPPASA₅WGS IRAAHAILGG L₁L₂WAVR GLLLKTRL

IL-11 mutein deriving from complete native rat IL-11 -SEQ ID NO:66- :

MNCVCR₁LV₂ VSLWPDRVV APGPPAGSPR VSSDPRADLD SAVLLTRSLL
 ADTRQLAAQM RDKFPADGDH NLD₃LPTLAM SAGTLGSQLQ PGVLTRLRVD
 LMSYFRHVQW LRRAAGPSLK TLEPELGALQ ARLERLLRRL QLLMSRLALP
 QAAPDQPAVP LGPPASA₅WGS IRAAHAILGG L₁L₂WAVR GLLLKTRL

IL-11 mutein deriving from complete native rat IL-11 -SEQ ID NO:67- :

MNCVCR₁LV₂ VSLWPDRVV APGPPAGSPR VSSDPRADLD SAVLLTRSLL
 ADTRQLAAQM RDKFPADGDH NLD₃LPTLAM SAGTLGSQLQ PGVLTRLRVD
 LMSYFRHVQW LRRAAGPSLK TLEPELGALQ ARLERLLRRL QLLMSRLALP
 QAAPDQPAVP LGPPASA₅WGS IRAAHAILGG L₁L₂WAVR GLLLKTRL

IL-11 mutein deriving from complete native rat IL-11 -SEQ ID NO:68- :

MNCVCR₁LV₂ VSLWPDRVV APGPPAGSPR VSSDPRADLD SAVLLTRSLL
 ADTRQLAAQM RDKFPADGDH NLD₃LPTLAM SAGTLGSQLQ PGVLTRLRVD
 LMSYFRHVQW LRRAAGPSLK TLEPELGALQ ARLERLLRRL QLLMSRLALP
 QAAPDQPAVP LGPPASA₅WGS IRAAHAILGG L₁L₂WAVR GLLLKTRL

FIGURE 15

Joined CDS for human complete native IL-11 -SEQ ID NO:69-:

atg aac tgt gtt tgc cgc ctg gtc gtc gtg ctg agc ctg tgg cca gat aca gct gtc gcc cct ggg cca cca
 cct ggc ccc cct cga gtt tcc cca gac cct cgg gcc gag ctg gac agc acc gtg ctc ctg acc cgc tct ctc
 ctg gcg gac acg cgg cag ctg gct gca cag ctg agg gac aaa ttc cca gct gac ggg gac cac aac ctg gat
 tcc ctg ccc acc ctg gcc atg agt gcg ggg gca ctg gga gct cta cag ctc cca ggt gtg ctg aca agg
 ctg cga gcg gac cta ctg tcc tac ctg cgg cac gtg cag tgg ctg cgc cgg gca ggt ggc tct tcc ctg aag
 acc ctg gag ccc gag ctg ggc acc ctg cag gcc cga ctg gac cgg ctg ctg cgc cgg ctg cag ctc ctg atg
 tcc cgc ctg gcc ctg ccc cag cca ccc ccg gac ccg ccg gcg ccc ccg ctg gcg ccc ccc tcc tca gcc tgg
 ggg ggc atc agg gcc gcc cac gac atc ctg ggg ggg ctg cac ctg aca ctt gac tgg gcc gtg agg gga
 ctg ctg ctg aag act cgg ctg tga

Joined CDS for the IL-11 mutein which derives from the 34aa-deleted human IL-11 – SEQ ID NO:70-:

cct cgg gcc gag ctg gac agc acc gtg ctc ctg acc cgc tct ctc ctg gcg gac acg cgg cag ctg gct gca
 cag ctg agg gac aaa ttc cca gct gac ggg gac cac aac ctg gat tcc ctg ccc acc ctg ggc atg agt gcg
 ggg gca ctg gga gct cta cag ctc cca ggt gtg ctg aca agg ctg cga gcg gac cta ctg tcc tac ctg cgg
 cac gtg cag tgg ctg cgc cgg gca ggt ggc tct tcc ctg aag acc ctg gag ccc gag ctg ggc acc ctg cag
 gcc cga ctg gac cgg ctg cgc cgg ctg cag ctc ctg atg tcc cgc ctg gcc ctg ccc cag cca ccc ccg
 gac ccg ccg ccc ccg ctg gcg ccc ccc tcc tca gcc tgg ggg ggc atc agg gcc cac gac atc
 ctg ggg ggg ctg n₁n₂n₃ ctg aca ctt n₄n₅n₆ tgg gcc gtg agg gga ctg ctg ctg aag act cgg ctg
 tga

wherein the codon n₁n₂n₃ and the codon n₄n₅n₆ are both chosen among the group comprising the nucleotide codons which codes for a hydrophobic aminoacid, namely for Alanine (A), Valine (V), Leucine (L), Isoleucine (I), Phenylalanine (F), Methionine (M), Proline (P), Tryptophan (W).

n₁n₂n₃ and n₄n₅n₆ can be chosen among the group comprising the following nucleotide codons:

- GCT, GCC, GCA, GCG
- GTT, GTC, GTA, GTG,
- TTA, TTG, CTT, CTC, CTA, CTG,
- ATT, ATC, ATA,
- TTT, TTC,
- ATG,
- CCT, CCC, CCA, CCG,
- TGG.

FIGURE 16A

Joined CDS for the IL-11 mutein which derives from the 21aa-deleted human IL-11 – SEQ ID NO:71:-

cct ggg cca cca cct ggc ccc cct cga gtt tcc cca gac cct cg^g gag ctg gac agc acc gt^g ctc ctg acc cgc tct ctc ctg gcg gac acg cg^g cag ctg gct gca cag ctg agg gac aaa ttc cca gct gac ggg gac cac aac ctg gat tcc ctg ccc acc ctg gcc atg agt g^{cg} ggg gca ctg gga gct cta cag ctc cca ggt gt^g ctg aca agg ctg cga g^{cg} gac cta ctg tcc tac ctg cgg cac gt^g cag tgg ctg egc cgg gca ggt ggc tct tcc ctg aag acc ctg gag ccc gag ctg ggc acc ctg cag g^{cc} cga ctg gac cgg ctg cgc cgg ctg cag ctc ctg atg tcc cgc ctg g^{cc} cag cca ccc c^{cg} gac cc^g cc^g ccc cc^g ctg g^{cg} ccc ccc tcc tca g^{cc} tgg g^{gg} g^{gg} g^{gc} atc agg g^{cc} g^{cc} c^{ac} g^{cc} atc ctg g^{gg} g^{gg} ctg n₁n₂n₃ ctg aca ctt n₄n₅n₆ tgg g^{cc} gt^g agg g^{ga} ctg ctg aag act cgg ctg tga

wherein the codon n₁n₂n₃ and the codon n₄n₅n₆ are as defined in Figure 16A.

Joined CDS for the IL-11 mutein which derives from the complete human IL-11 –SEQ ID NO:72:-

atg aac tgt gtt tgc cgc ctg gtc ctg gtc gt^g ctg agc ctg tgg cca gat aca gct gtc g^{cc} cct g^{gg} cca cca cct g^{gc} ccc c^{ct} cga gtt tcc cca gac cct cgg g^{cc} gag ctg gac agc acc gt^g ctc ctg acc cgc tct ctc ctg g^{cg} gac acg cg^g cag ctg gct gca cag ctg agg gac aaa ttc cca gct gac g^{gg} gac cac aac ctg gat tcc ctg ccc acc ctg g^{cc} atg agt g^{cg} g^{gg} g^{ca} ctg g^{ga} gct cta cag ctc cca ggt gt^g ctg aca agg ctg cga g^{cg} gac cta ctg tcc tac ctg cgg cac gt^g cag tgg ctg cgc cgg g^{ca} ggt g^{gc} tct tcc ctg aag acc ctg gag ccc gag ctg g^{gc} acc ctg cag g^{cc} g^{cc} g^{cc} g^{cc} g^{cc} ctg c^{cg} c^{gg} c^{gg} ctg c^{gg} c^{gg} atg tcc cgc ctg g^{cc} ctg ccc c^{ag} cca ccc c^{cg} gac c^{cg} c^{cg} c^{cg} c^{cg} ctg g^{cc} c^{cc} c^{cc} tcc tca g^{cc} tgg g^{gg} g^{gc} atc agg g^{cc} g^{cc} cac g^{cc} atc ctg g^{gg} g^{gg} ctg n₁n₂n₃ ctg aca ctt n₄n₅n₆ tgg g^{cc} gt^g agg g^{ga} ctg ctg aag act cgg ctg tga

wherein the codon n₁n₂n₃ and the codon n₄n₅n₆ are as defined in Figure 16A.

25/48

Mutated AY207429 nucleic acid -SEQ ID NO:74:-

1 acacacctgtat tcccaccact ttggggaggct gaggcgggag gatgacctga gctcaggagt
 61 ttgagaccag cctgggcaac atggcaaaac cctatctcta ctaaaaatac aaaaaatagc
 121 caggcatgtt ggcgggtgcc tctaattccca gctactcagg aggctgaggc atgagaatca
 181 cttgaacctg ggaggcggag gttacagtga gctgagatca caccactgca ccccgacgctg
 241 ggtgacacag cgagactctg tctcaaaaaa accaaaaaacc agggcaggca cggtagctca
 301 cacctgtcat cccagcaatt tgggaggccc aggaggcggg atcacgaagt caggagttcg
 361 agaccagcct ggccaacatg gtaagacccc gtctctacta aaaatacaa attaqccggg
 421 tgtgttgccg cacacctgtat atccccacta cttgggaggc tgagggcagga gaatcgctt
 481 aaccggggag gtggagggtt cagttagctg agattgtgcc attgatcgcg ccattgcact
 541 ccagcctggg tgacagatg agactcagta ccaaaaaaca aacaaaacaaa aaacaaacaa
 601 aaaatgagaa aggctttac tctctgcccc cattgtctgag tccccacat ctacgcgtct
 661 ctgtctttct aataatctctg tctccccctt tctgtccctg gggcctctcc gtcctgtca
 721 ctctgccccg tgcgtctgtt tgcctgggtc ctttcttcag ctgcggcatt ctctgtctca
 781 gagtcttgtt gtctctgttc ctttcccccc ggggtctccc tgggtctccc caagtccctc
 841 ctgctgtctt cctcccgctc tctgatctt gactcccaga acctctccct ctgtctccag
 901 ggcgtccccct ctgatccctt ttgccttctt ggtgtgtctc tctggctgcc tccatctctg
 961 tggatctccg tctccctgtc tctgtctcag tctgtccctc actctgtgtg tgggtgtgtg
 1021 tgtctctctc tctctctctc cttcccttcc actcccttcc ctcctctgcct ccacctctcc
 1081 aggccccctgt ctgtccctc cgtccggcct ttctctgcct ttccgtctcc ctgcctcccc
 1141 atctctctct gctatctctg gtccagccgg accccccaccc acagtcggc ccoagcgttt
 1201 gagectgtat gtctgtcccg gcccgtggag gtggaggagg gggacgcgg tgacctcacc
 1261 agcccccttc cgaccacccc cccctttccc ttttcaactt ttccaactt tccttcgtg
 1321 ccctctctcg agcggccggc cgtgaggccct gcaaggcagc cgtccgtct gaatggaaaa
 1381 ggcaggcagg gagggtgagt caggatgtgt caggccggcc tccctgtccg cctggccccc
 1441 gcccggcccg cccagccccc tatataaccc cccaggcgtc cacaactt cactggccgg
 1501 gcccgtgtc tcaggccaca tgcctccct ccccaggccg cggcccaactt gacccctggg
 1561 gctcccccgg cagggacag ggaagggtt aaggcccccc gctccctgcc ccctgcctt
 1621 gggAACCCCT ggccctgtgg ggacatgaac tggtaagttgg ttcatgggg ggggggggg
 1681 gacaggaggag caggaggag aggacccac ggcgggggtt ggagcagacc ccgtgagtc
 1741 gcacagagag ggacccggag acaggcagcc ggggaggaga gcaaggcggc gacccatc
 1801 cggcgaggaa gatgggcaga gagagacaca gacaggagcg gatggaggca gccaatcaga
 1861 ggcgcgcgcag gaggacggg ccagacaggg ccccgagagg gacgcggac gggagaccga
 1921 gcaggggcag ggacgcaggg actgggtccg ggaggggaggt gacccatc gaccaggcc
 1981 ccagggagcc cgcggggacc gggagactcc ctgggattcc ggcagagagg ctccggaggg
 2041 aaactgaggc agggtcccgag gagagcggag caagccaggg agtagcggacc ccagccgggg
 2101 ggaggagaga gactgggcgc ggggggaaag cggggagagc cggggcagatg cggcggacgg
 2161 aggccgcggc acaccgcacgg ctggcggggcc cggggggccgg gctgggggtg tgcqaggcgc
 2221 gggcgccgg ggagcgctga ttggctggcg ggtggccggg tggggggggc ggcgggggtg
 2281 gctgcgggg agcgagctcc ggaccccccgc gcccccccgcg ccccccggc ccccccggc
 2341 cagctctccc gctcccgccg cccggccggg cccatggctc tgccctctc cgeccaggtg
 2401 cgctgcggcc cgggttctg ccggccaccc ggcggggctc ctgggaggcc gtcataagggg
 2461 tctccctgtt gagagggtccg tgcgtctcccg gtcctgtctt ggcttctggc tccttccct
 2521 gctccctggcc agctcggtt ccccgccggcc ggggggggggg caggttctgg cctgtgcetc
 2581 ccccaaccatg ccccgccccc gggcccagat tccggcgctc gggggccggac gggagacgccc
 2641 cggcccgctc acccgccccc ggccgcgtct gtcggacggc gggggccggc cagagccagg
 2701 gagggagagg gaagccgcg tggccctgcg acctgcccgc gggcggttcca ccctgggact
 2761 taagacctcc agctccatcc tccctaaggc cgggagttca gggcccgac cctccctcccc
 2821 gagaccagg agtccagacc ccaggccctc ctccctcaga ccttaggagtc cagggcccca
 2881 gcctctccct cctcagaccc aggaggagtc cagacccac gtcctccctcc ctcaagaccgg
 2941 ggagtccagg cccaggccct cctctctctg accccggagtc cagcctgagc tctctgcctt
 3001 atccctggccc cagggttttgc cggcctggcc ctgggtcgcc tgagccgttg gccagataca
 3061 gctgtcgccc ctggggccacc acctggccccc cctcgagttt ccccgacccc tcggggccgg
 3121 ctggacagca ccgtgtctt gaccgcgtct ctccctggccgg acacgcggca gtcggctgca
 3181 cagctggtag gagagactgg gtcggggccca gcacaggagt gagaggcaga gaggaaacgg

FIGURE 17

3241 gaggagtctg cgggcagcca cttggagggg ttctgggctc tcaggtggca gagtgaggga
 3301 ggggaagagt tggggccctg gcgtggggga tggagggagc cccgaggctg ggcaggggcc
 3361 acctcacagc tttttccct gccagagggc caaattccca gctgacgggg accacaacct
 3421 gtatcccctg cccaccctgg coatgagtgc gggggcactg ggagctctac agttaaggc
 3481 aaggagttgg gctgggaca aggtgggagg caggcagtga agggggcggg gaggatgagg
 3541 ggcactggtc gggtgttctc tgatgtcccg gcttatccc cagctccctag gtgtgtctac
 3601 aaggctgcga ggggacactac tgcttactt gggcacgtg cagtggctgc gccggggcagg
 3661 tggcttccctc ctgaagaccc tggagccca gctgggcacc ctgcaggccc gactggacc
 3721 gctgtgcgc cggctgcgc tctggatg tcctggcccc aagactgac accccagacc
 3781 ccccccattt gccccaaaat cctgtggctt gacttcttga agcctgagac cccagacc
 3841 atgtcaacag ccccgctctg accaccctgac accctaatacg cccgctctga gaccctgaca
 3901 ccgttaacagc cccgctctga gaccctgacc ctaacagtcc tgctctgaga ccctgacc
 3961 gcagtcccaa gatctgtgg ccctgagacc ctgaggccc agaccccaa atctggcc
 4021 gaaacttcaa atttcaccc aagaccctga gactccatca tccatgaccc caaagtcccc
 4081 agatcccagc cccttaagacc caagaccctt tcctgaagcc caaagcttg agaattcaaa
 4141 tcctcaccc aagacttgg gaccctggcc ccatgacatt gaaaaccatg gacctggcca
 4201 ggcgtgggg ctcacgcctg taatccctga actttggag gccgaggca gtggatcacc
 4261 tgaggtcggtt agttcaagac cagccagacc aacatggtga aaccctgtct ctactaaaa
 4321 tacaaaattt gccaggctg gtgggtcatg cctgtatcc cagctacttgg gggggctgag
 4381 gcaggagaat cgcttgaacc tgggaggcgg aggttgcagt gagccgagat cgcaccatta
 4441 cactccagcc tggcaacaa gagcaaaact ccctctctt caaaaaaaaaaaaaaaaaaaa
 4501 aaaagaagga aaagaaaaacc atggacccctt agaccctgag accccagggcc ccagccctga
 4561 gatcctgaca tcttaaatggat cccaggccct aagatacaag accttgaccc aaagccagcc
 4621 ttgggaccctt ggctgtacaa acccaagacc tccaggaccc agaccccgag ccctgaggcc
 4681 ctatgtctca ctcccaacat cggaaaaccctt gacacccctt atcttgagcc tgcgcctgt
 4741 cgactccaaag accccctactt cccaaagccag gcccaaaagcc ctgagaccag aagacttcaa
 4801 accctggttt ttgggcctaa ctccaaagac cctgatctc aaattccaaat ttcttagctt
 4861 gagactccag ccctcaccctt tgagttccctg aacttgaacc cagagacccc atctctaaga
 4921 cttcagccctt gagatccagg gcctgaccctt agactcgagc ccacagaccc cagataactgt
 4981 ctgtaaaacc ccagctctgg tggggaggcag tggctactt ctgtatccc aaggcagggg
 5041 aggccaaggc agaaggaccc tttggggccca tgagggttggag acaggctggg cagcatagca
 5101 agactctttt tcttaattttt tattttttt attttttttt ggagacagat tctcgctc
 5161 tggcccttgg gcttaggtgc aatgggtccca ttccggctt ctggaaacctt cgcctctgg
 5221 gctcaagcgtt ttcctctgttcc tccggcttctt gatgtctgg gacttctgg gacactgccc
 5281 acaccggat aatttttttt tttttttttagt gacacgggtt ttcaccgtgt tgcccaggct
 5341 gtcacaaaac tccctgatctc aggccatccg cccgccttgg cctccaaag cgctggata
 5401 acaggcgtga tcccgcgcgc ctggcttctt aatttttcttta acagcagcca caacaacaaa
 5461 aaccctactc tgagatttca gccccggcga ctctaaacat cccaggcccg atccctcacc
 5521 tagaacccgag atgcacccccc tgactccaca gacttcaccc ccaacccca cactcagctc
 5581 tggaaagcccg tcctgactcc accctccattt ttcggaaaccc cacagcttga agagctcccg
 5641 gccttaacac ttcacccac gggccacactt cccctgttga atatgcagcc cgcattcagc
 5701 tgcagctcca cagcaccctt gcccgttccccc cccgttgcac ccccttactt tgactcac
 5761 ctctcccttc cccacagatg tcccgcttgg ccctggccca gccacccccc gaccggccgg
 5821 cggcccccgtt ggcggccccc ttctcagctt gggggggcat cagggccccc cacggccatcc
 5881 tggggggggctt qn1n2n3n4n5n6n7n8n9n10n11n12n13n14n15n16n17n18n19n20n21n22n23n24n25n26n27n28n29n30n31n32n33n34n35n36n37n38n39n40n41n42n43n44n45n46n47n48n49n50n51n52n53n54n55n56n57n58n59n60n61n62n63n64n65n66n67n68n69n70n71n72n73n74n75n76n77n78n79n80n81n82n83n84n85n86n87n88n89n90n91n92n93n94n95n96n97n98n99n100n101n102n103n104n105n106n107n108n109n110n111n112n113n114n115n116n117n118n119n120n121n122n123n124n125n126n127n128n129n130n131n132n133n134n135n136n137n138n139n140n141n142n143n144n145n146n147n148n149n150n151n152n153n154n155n156n157n158n159n160n161n162n163n164n165n166n167n168n169n170n171n172n173n174n175n176n177n178n179n180n181n182n183n184n185n186n187n188n189n190n191n192n193n194n195n196n197n198n199n200n201n202n203n204n205n206n207n208n209n210n211n212n213n214n215n216n217n218n219n220n221n222n223n224n225n226n227n228n229n230n231n232n233n234n235n236n237n238n239n240n241n242n243n244n245n246n247n248n249n250n251n252n253n254n255n256n257n258n259n260n261n262n263n264n265n266n267n268n269n270n271n272n273n274n275n276n277n278n279n280n281n282n283n284n285n286n287n288n289n290n291n292n293n294n295n296n297n298n299n299n300n301n302n303n304n305n306n307n308n309n310n311n312n313n314n315n316n317n318n319n320n321n322n323n324n325n326n327n328n329n330n331n332n333n334n335n336n337n338n339n340n341n342n343n344n345n346n347n348n349n350n351n352n353n354n355n356n357n358n359n360n361n362n363n364n365n366n367n368n369n370n371n372n373n374n375n376n377n378n379n380n381n382n383n384n385n386n387n388n389n389n390n391n392n393n394n395n396n397n398n399n399n400n401n402n403n404n405n406n407n408n409n409n410n411n412n413n414n415n416n417n418n419n419n420n421n422n423n424n425n426n427n428n429n429n430n431n432n433n434n435n436n437n438n439n439n440n441n442n443n444n445n446n447n448n449n449n450n451n452n453n454n455n456n457n458n459n459n460n461n462n463n464n465n466n467n468n469n469n470n471n472n473n474n475n476n477n478n479n479n480n481n482n483n484n485n486n487n488n489n489n490n491n492n493n494n495n496n497n498n499n499n500n501n502n503n504n505n506n507n508n509n509n510n511n512n513n514n515n516n517n518n519n519n520n521n522n523n524n525n526n527n528n529n529n530n531n532n533n534n535n536n537n538n539n539n540n541n542n543n544n545n546n547n548n549n549n550n551n552n553n554n555n556n557n558n559n559n560n561n562n563n564n565n566n567n568n569n569n570n571n572n573n574n575n576n577n578n579n579n580n581n582n583n584n585n586n587n588n589n589n590n591n592n593n594n595n596n597n598n599n599n600n601n602n603n604n605n606n607n608n609n609n610n611n612n613n614n615n616n617n618n619n619n620n621n622n623n624n625n626n627n628n629n629n630n631n632n633n634n635n636n637n638n639n639n640n641n642n643n644n645n646n647n648n649n649n650n651n652n653n654n655n656n657n658n659n659n660n661n662n663n664n665n666n667n668n669n669n670n671n672n673n674n675n676n677n678n679n679n680n681n682n683n684n685n686n687n688n689n689n690n691n692n693n694n695n696n697n698n699n699n700n701n702n703n704n705n706n707n708n709n709n710n711n712n713n714n715n716n717n718n719n719n720n721n722n723n724n725n726n727n728n729n729n730n731n732n733n734n735n736n737n738n739n739n740n741n742n743n744n745n746n747n748n749n749n750n751n752n753n754n755n756n757n758n759n759n760n761n762n763n764n765n766n767n768n769n769n770n771n772n773n774n775n776n777n778n779n779n780n781n782n783n784n785n786n787n788n789n789n790n791n792n793n794n795n796n797n798n799n799n800n801n802n803n804n805n806n807n808n809n809n810n811n812n813n814n815n816n817n818n819n819n820n821n822n823n824n825n826n827n828n829n829n830n831n832n833n834n835n836n837n838n839n839n840n841n842n843n844n845n846n847n848n849n849n850n851n852n853n854n855n856n857n858n859n859n860n861n862n863n864n865n866n867n868n869n869n870n871n872n873n874n875n876n877n878n879n879n880n881n882n883n884n885n886n887n888n889n889n890n891n892n893n894n895n896n897n898n899n899n900n901n902n903n904n905n906n907n908n909n909n910n911n912n913n914n915n916n917n918n919n919n920n921n922n923n924n925n926n927n928n929n929n930n931n932n933n934n935n936n937n938n939n939n940n941n942n943n944n945n946n947n948n949n949n950n951n952n953n954n955n956n957n958n959n959n960n961n962n963n964n965n966n967n968n969n969n970n971n972n973n974n975n976n977n978n979n979n980n981n982n983n984n985n986n987n988n989n989n990n991n992n993n994n995n996n997n998n999n999n1000n1001n1002n1003n1004n1005n1006n1007n1008n1009n1009n1010n1011n1012n1013n1014n1015n1016n1017n1018n1019n1019n1020n1021n1022n1023n1024n1025n1026n1027n1028n1029n1029n1030n1031n1032n1033n1034n1035n1036n1037n1038n1039n1039n1040n1041n1042n1043n1044n1045n1046n1047n1048n1049n1049n1050n1051n1052n1053n1054n1055n1056n1057n1058n1059n1059n1060n1061n1062n1063n1064n1065n1066n1067n1068n1069n1069n1070n1071n1072n1073n1074n1075n1076n1077n1078n1079n1079n1080n1081n1082n1083n1084n1085n1086n1087n1088n1089n1089n1090n1091n1092n1093n1094n1095n1096n1097n1098n1099n1099n1100n1101n1102n1103n1104n1105n1106n1107n1108n1109n1109n1110n1111n1112n1113n1114n1115n1116n1117n1118n1119n1119n1120n1121n1122n1123n1124n1125n1126n1127n1128n1129n1129n1130n1131n1132n1133n1134n1135n1136n1137n1138n1139n1139n1140n1141n1142n1143n1144n1145n1146n1147n1148n1149n1149n1150n1151n1152n1153n1154n1155n1156n1157n1158n1159n1159n1160n1161n1162n1163n1164n1165n1166n1167n1168n1169n1169n1170n1171n1172n1173n1174n1175n1176n1177n1178n1179n1179n1180n1181n1182n1183n1184n1185n1186n1187n1188n1189n1189n1190n1191n1192n1193n1194n1195n1196n1197n1198n1199n1199n1200n1201n1202n1203n1204n1205n1206n1207n1208n1209n1209n1210n1211n1212n1213n1214n1215n1216n1217n1218n1219n1219n1220n1221n1222n1223n1224n1225n1226n1227n1228n1229n1229n1230n1231n1232n1233n1234n1235n1236n1237n1238n1239n1239n1240n1241n1242n1243n1244n1245n1246n1247n1248n1249n1249n1250n1251n1252n1253n1254n1255n1256n1257n1258n1259n1259n1260n1261n1262n1263n1264n1265n1266n1267n1268n1269n1269n1270n1271n1272n1273n1274n1275n1276n1277n1278n1279n1279n1280n1281n1282n1283n1284n1285n1286n1287n1288n1289n1289n1290n1291n1292n1293n1294n1295n1296n1297n1298n1299n1299n1300n1301n1302n1303n1304n1305n1306n1307n1308n1309n1309n1310n1311n1312n1313n1314n1315n1316n1317n1318n1319n1319n1320n1321n1322n1323n1324n1325n1326n1327n1328n1329n1329n1330n1331n1332n1333n1334n1335n1336n1337n1338n1339n1339n1340n1341n1342n1343n1344n1345n1346n1347n1348n1349n1349n1350n1351n1352n1353n1354n1355n1356n1357n1358n1359n1359n1360n1361n1362n1363n1364n1365n1366n1367n1368n1369n1369n1370n1371n1372n1373n1374n1375n1376n1377n1378n1379n1379n1380n1381n1382n1383n1384n1385n1386n1387n1388n1389n1389n1390n1391n1392n1393n1394n1395n1396n1397n1398n1399n1399n1400n1401n1402n1403n1404n1405n1406n1407n1408n1409n1409n1410n1411n1412n1413n1414n1415n1416n1417n1418n1419n1419n1420n1421n1422n1423n1424n1425n1426n1427n1428n1429n1429n1430n1431n1432n1433n1434n1435n1436n1437n1438n1439n1439n1440n1441n1442n1443n1444n1445n1446n1447n1448n1449n1449n1450n1451n1452n1453n1454n1455n1456n1457n1458n1459n1459n1460n1461n1462n1463n1464n1465n1466n1467n1468n1469n1469n1470n1471n1472n1473n1474n1475n1476n1477n1478n1479n1479n1480n1481n1482n1483n1484n1485n1486n1487n1488n1489n1489n1490n1491n1492n1493n1494n1495n1496n1497n1498n1499n1499n1500n1501n1502n1503n1504n1505n1506n1507n1508n1509n1509n1510n1511n1512n1513n1514n1515n1516n1517n1518n1519n1519n1520n1521n1522n1523n1524n1525n1526n1527n1528n1529n1529n1530n1531n1532n1533n1534n1535n1536n1537n1538n1539n1539n1540n1541n1542n1543n1544n1545n1546n1547n1548n1549n1549n1550n1551n1552n1553n1554n1555n1556n1557n1558n1559n1559n1560n1561n1562n1563n1564n1565n1566n1567n1568n1569n1569n1570n1571n1572n1573n1574n1575n1576n1577n1578n1579n1579n1580n1581n1582n1583n1584n1585n1586n1587n1588n1589n1589n1590n1591n1592n1593n1594n1595n1596n1597n1598n1599n1599n1600n1601n1602n1603n1604n1605n1606n1607n1608n1609n1609n1610n1611n1612n1613n1614n1615n1616n1617n1618n1619n1619n1620n1621n1622n1623n1624n1625n1626n1627n1628n1629n1629n1630n1631n1632n1633n1634n1635n1636n1637n1638n1639n1639n1640n1641n1642n1643n1644n1645n1646n1647n1648n1649n1649n1650n1651n1652n1653n1654n1655n1656n1657n1658n1659n1659n1660n1661n1662n1663n1664n1665n1666n1667n1668n1669n1669n1670n1671n1672n1673n1674n1675n1676n1677n1678n1679n1679n1680n1681n1682n1683n1684n1685n1686n1687n1688n1689n1689n1690n1691n1692n1693n1694n1695n1696n1697n1698n1699n1699n1700n1701n1702n1703n1704n1705n1706n1707n1708n1709n1709n1710n1711n1712n1713n1714n1715n1716n1717n1718n1719n1719n1720n1721n1722n1723n1724n1725n1726n1727n1728n1729n1729n1730n1731n1732n1733n1734n1735n1736n1737n1738n1739n1739n1740n1741n1742n1743n1744n1745n1746n1747n1748n1749n1749n1750n1751n1752n1753n1754n1755n1756n1757n1758n1759n1759n1760n1761n1762n1763n1764n1765n1766n1767n1768n1769n1769n1770n1771n1772n1773n1774n1775n1776n1777n1778n1779n1779n1780n1781n1782n1783n1784n1785n1786n1787n1788n1789n1789n1790n1791n1792n1793n1794n1795n1796n1797n1798n1799n1799n1800n1801n1802n1803n1804n1805n1806n1807n1808n1809n1809n1810n1811n1812n1813n1814n1815n1816n1817n1818n1819n1819n1820n1821n1822n1823n1824n1825n1826n1827n1828n1829n1829n1830n1831n1832n1833n1834n1835n1836n1837n1838n1839n1839n1840n1841n1842n1843n1844n1845n1846n1847n1848n1849n1849n1850n1851n1852n1853n1854n1855n1856n1857n1858n1859n1859n1860n1861n1862n1863n1864n1865n1866n1867n1868n1869n1869n1870n1871n1872n1873n1874n1875n1876n1877n1878n1879n1879n1880n1881n1882n1883n1884n1885n1886n1887n1888n1889n1889n1890n1891n1892n1893n1894n1895n1896n1897n1898n1899n1899n1900n1901n1902n1903n1904n1905n1906n1907n1908n1909n1909n1910n1911n1912n1913n1914n1915n1916n1917n1918n1919n1919n1920n1921n1922n1923n1924n1925n1926n1927n1928n1929n1929n1930n1931n1932n1933n1934n1935n1936n1937n1938n1939n1939n1940n1941n1942n1943n1944n1945n1946n1947n1948n1949n1949n1950n1951n1952n1953n1954n1955n1956n1957n1958n1959n1959n1960n1961n1962n1963n1964n1965n1966n1967n1968n1969n1969n1970n1971n1972n1973n1974n1975n1976n1977n1978n1979

27/48

6601 tttttgagat ggagtctcg tctgttgctt aggctggagt gcagtgaggc aatctaagg
 6661 cactgcaacc tccacccccc gggttcaagc aattcttcctg cctcagccctc ccgatttagct
 6721 gggatcacag gtgtcacca ccatgcccag ctaattattt atttcttttgc tatttttagt
 6781 agagacaggg tttcacccatg ttggccaggc tggtttcgaa ctccctgaccc caggtgatcc
 6841 tcctgcctcg gcctccaaa gtgctggat tacagggtgt agccaccaca cctgaccatc
 6901 aggttctcaa taaatattt atggaagggtt ccacaagtca ccctgtgatc aacagtaccc
 6961 gtatgggaca aagctgcaag gtcaagatgg ttcattatgg ctgtgttac catagcaa
 7021 tggaaacaat ctatatatcc aacagtggagg gttaaagcaac atggtgatc tggataga
 7081 acgccaccca gccccccgga gcagggactg tcattcaggg aggctaagga gagaggctt
 7141 cttgggatata agaaagatata cctgacattt gcccaggatg gtggctcactg cctgtaatcc
 7201 tggcacttgc ggagggacgaa gcgagtgatgg cactgaaatgc caagagttt agaccggcc
 7261 gcgagacatg gcaaaaccct gtctaaaaaaa agaaagaatg atgtctgc acatgaaac
 7321 aggctacaaa accactgcat gctgtgatcc caattttgtt ttttcttcc tatatatgg
 7381 taaaacaaa aatctaaag gaaaataacgc caaaatgtt acaatgactg tctccagg
 7441 aaaggagaga ggtgggattt tgggtgactt ttaatgttgc tgattgtctg tattttac
 7501 aatttctgcc atgactgtgtt attttgcattt acacattttt aaaataataa acactattt
 7561 tagaataaca gaatatcaggc ctccctctt ccaaaaataa gccctcagga ggggacaa
 7621 ttgaccgctg attgagcctg tcagggtgtt gcaactaagg tgggctttt acttacac
 7681 tcctccttggaa ctcttgcata cgcctgttt tacaggcgg gggaaactgag tctcagac
 7741 ggagtggggaa ctcttgcata caaagtccaca cagctaggaa gagggtggaa tgggattct
 7801 cgccgtgttgc ggcttccccc caaagctctc ttttgcaggc ggtgttggagg aatccctg
 7861 acatgcacac acatgagata tggagaaaca ggttcagtaa ggatttgggtt cttacccagg
 7921 gccttagagaa gggtaatgg cagagtaggg atgataattt aaatgcttta gttactttt
 7981 ccttacaat aaccacagaca gacttccagg ggcggcgtgt cgtcactatgt ttgagtct
 8041 gtttggaggt gcccattctg gggccgggat ttttgcatttcc ccatcatagc cctcaagact
 8101 ccaggctggc tggggcgggt ggctcacgc ttttgcatttcc cacttccggg aggctgagg
 8161 ggggtggatca ctttgcggatc gggttcaag gcccggctt ccaacatggaa gaaaccctgt
 8221 ctctactaaa aatacaatcc agtactctgg aaggctgggg caggagaatc gctcgaa
 8281 aggagacggg ggttgcgggtt agccggatc acatcacaaa cagccctagg cagtgcgg
 8341 ccccaaggcgc ggctcagacc tggccctccaca gagctgtctg ggtgtatgtt cctccct
 8401 ggaggcaggg ttttgcggctt ccctggggcc cccggactt taaggctgtt tggggatgg
 8461 atggagtttc gctcttttgc ctaggctgttgc gtgcaggatgtt gcaatcttca
 8521 gggcaacaatg agtggaaatcc catctcaaaa aacaaaaaaac aaacaaacaaa
 8581 ccaggctgttgc tccctggagg agaaggggggcc ccacagttcc cggagatgtt
 8641 cccctgtgttgc tccgtatgggg ttttgcggcc cccggacttcc cccagacccc
 8701 tgctgtccac cctggcagggg ccatggcggg gggccggatgtt tccctggcc
 8761 acgtctgttgc acgtcgatgtt ccaggccccc gtggatccccc acgggtcaag
 8821 cggggctgggg aggctgtcaccc gcttggggcc tgggtccctt aaccaggatacc
 8881 agccaccatg atctggcttc gaaacaggag gtggcttgc cgcgtccagg
 8941 gtgggtccctt gtttgggggg agtgcacaaa gacccctccag aaggggcgatgtt
 9001 ccgtccgttgc cccatgttgc agagtaactt tgggtcccttcc agtgcggcc
 9061 ggctgagagg gacagaggggg aaccaaggcc cccctgtctg ggggatcttgc
 9121 ggttttgcac gtcactgtgtt gggggacat caggggggg gctcaggctg
 9181 aggaaggagg ggtcccgatcc cccctctccctt ggctggccca ggtgaccat
 9241 cagtgttgc ttttgcgg
 9301 gcttgggttgc gcttgcacatc ttttgcgggggggggggggggggggggggggg
 9361 gcttgggttgc gaccagggtgc cgcatttttttttttttttttttttttttttt
 9421 gctcttagacg ctcccttctc ccttgcggcc gatgtatcccccc
 9481 cgtccatgtac ctctctgttgc ggcggctgttgc gcttgcggcc
 9541 cctggcccttgc gacggcccttgc acaacagggtt gggcttgc
 9601 catcaacccctg cttcaggagc cggctccacatc ttttgcggcc
 9661 cctggatata gggccatgttgc ctccaccccttgc caccgtggagg
 9721 gctccacacatc ccaggccatgttgc gcaaggccca ggaaccctcc
 9781 cgaccaagag cccaaatgttgc agg

//

wherein the codon n₁n₂n₃ and the codon n₄n₅n₆ are as defined in Figure 16A.

FIGURE 17

28/48

mRNA of IL-11 mutein deriving from human IL-11 -SEQ ID NO:75:-

gaa ggg uua aag gcc ccc ggc ucc cug ccc ccu gcc cug ggg aac ccc ugg ccc ugu ggg gac aug
aac ugu guu ugc cgc cug guc cug gug cug agc cug ugg cca gau aca gcu guc gcc ccu ggg
cca cca ccu ggc ccc ccu cga guu ucc cca gac ccu cgg gcc gag cug gac acc gug cuc cug acc
cgc ucu cuc cug gcg gac acg cgg cag cug gcu gca cag cug agg gac aaa uuc cca gcu gac ggg
gac cac aac cug gau ucc cug ccc acc cug gcc aug agu gcg ggg gca cug gga gcu cua cag cuc
cca ggu gug cug aca agg cug cga gcg gac cua cug ucc uac cug cgg cac gug cag ugg cug cgc
cgg gca ggu ggc ucu ucc cug aag acc cug gag ccc gag cug ggc acc cug cag gcc cga cug gac
cgg cug cug cgc cgg cug cag cuc aug ucc cgc cug gcc cug ccc cag cca ccc ccc gac ccc ccc
gca ccc ccc ccc ccc ucc uca gcc ugg ggg ggc auc agg gcc cac gcc auc cug ggg
ggg cug n₁n₂n₃ cug aca cuu n₄n₅n₆ ugg gcc gug agg gga cug cug cug aag acu cgg cug uga
ccc ggg gcc caa agc cac cac cgu ccu ucc aaa gcc aga ucu uau uua uuu uau uuc agu acu
ggg ggc gaa aca gcc agg uga ucc ccc cgc cau uau cuc ccc cua guu aga gac agu ccu ucc gug
agg ccu ggg ggg cau cug ugc cuu auu uau acu uau uua uuu cag gag cag ggg ugg gag gca ggu
gga cuc cug ggu ccc cga gga ggg gac ugg ggu ccc gga uuc uug ggu cuc caa gaa guc ugu
cca cag acu ucu gcc cug gcu cuu ccc cau cua ggc cug ggc agg aac aua uau uua uuu aag
caa uua cuu uuc aug uug ggg ugg gga cgg agg gga aag gga agc cug ggu uuu ugu aca aaa aug
uga gaa acc uuu gug aga cag aga aca ggg aau uaa aug ugu cau aca uau cca cuu gag ggc gau
uug ucu gag agc ugg ggc ugg aug cuu ggg uaa cug ggg cag ggc agg ugg agg gga gac cuc cau
uca ggu gga ggu ccc gag ugg gcg ggg cag cga cug gga gau ggg ucg guc acc cag aca gcu cug
ugg agg cag ggu cug agc cuu gcc ugg ggc ccc gca cug cau agg gcc guu ugu uug uuu uuu gag
aug gag ucu cgc ucu guu gcc uag gcu gga gug cag uga ggc aau cua agg uca cug caa ccc cca
ccu ccc ggg uuc aag caa uuc ucc ugc cuc agc cuc ccg aau agc ugg gau cac agg ugu gca cca
cca ugc cca gcu aau uau uua uuu cuu uug uau uuu uag uag aga cag ggu uuc acc aug uug gcc
agg cug guu ucg aac ucc uga ccu cag gug auc cuc cug ccu cgg ccu ccc aaa gug cug gga uua
cag gug uga gcc acc aca ccc gac cca uag guc uuc aau aaa uau uua aug gaa ggu ucc aca agu cac
ccu cug auc aac agu acc cgu aug gga caa gcu gca agg uca aga ugg uuc aau aug gcu gug uuc
acc aua gca aac ugg aaa caa ucu aga uau cca aca gug agg guu aag caa cau ggu gca ucu gug

FIGURE 18

gau aga acg cca ccc agc cgc ccg gag cag gga cug uca uuc agg gag gcu aag gag aga ggc uug
cuu ggg aua uag aaa gau auc cug aca uug gcc agg cau ggu ggc uca cgc cug uaa ucc ugg cac
uuu ggg agg acg aag cga gug gau cac uga agu cca aga guu uga gac cgg ccu gcg aga cau ggc
aaa acc cug ucu caa aaa aga aau gau guc cug aca uga aac agc agg cua caa aac cac ugc aug
cug uga ucc caa uuu ugu guu uuu cuu ucu aua uau gga uua aaa caa aaa ucc uaa agg gaa aua
cgc caa aau guu gac aau gac ugu cuc cag gac aaa gga gag agg ugg gau ugu ggg uga cuu uua
aug ugu aug auu guc ugu auu uua cag aau uuc ugc cau gac ugu gua uuu ugc aug aca cau uuu
aaa aau aau aaa cac uau uuu uag aau

wherein the codon $n_1n_2n_3$ and the codon $n_4n_5n_6$ are both chosen among the group comprising the nucleotide codons which codes for a hydrophobic aminoacid, namely for Alanine (A), Valine (V), Leucine (L), Isoleucine (I), Phenylalanine (F), Methionine (M), Proline (P), Tryptophan (W).

$n_1n_2n_3$ and $n_4n_5n_6$ can be chosen among the group comprising the following nucleotide codons:

- GCU, GCC, GCA, GCG
- GUU, GUC, GUA, GUG,
- UUA, UUG, CUU, CUC, CUA, CUG,
- AUU, AUC, AUA,
- UUU, UUC,
- AUG,
- CCU, CCC, CCA, CCG,
- UGG.

FIGURE18

30/48

Gene of IL-11 muteins deriving from human IL-11 – SEQ ID NO:76:-

gaagggtta aaggcccccg gctccctgccc ccctgcctcg
 gggaaaccctt ggccctgtgg ggacatgaac tgtaagttgg ttcatgggaa ggggtggaggg
 gacaggggagg cagggaggag agggaccac ggcgggggtg ggagcagacc ccgctgagtc
 gcacagagag ggaccggag acaggcagcc ggggaggaga gcagcttcgg agacaggagg
 cggcggagga gatgggcaga gagagacaca gacaggagcg gatggagggca gccaatcaga
 ggccgcgcag gaggggacggg ccagacaggg ccccggaggg gagcgagacg cggagaccga
 gcagggggcag ggacgcaggg actgggtccg ggagggaggt gaccccccattc gaccaggccc
 ccagggagcc cgccggggacc gggagactcc ctggattcc ggcagagagg ctccggaggg
 aaactgaggc agggtcccg gagagcggag caagccaggg agtagcgacc ccagccgggg
 ggagggagaga gactggcgcc ggggggaaag cggggagagc cgggcagatg cggccgacgg
 aggccgoggac agaccgacgg ctggcgccc cggggggcgg gctgggggtg tgcgaggcgc
 gggcgcccg ggagcgctga ttggctggcg ggtggccggg tggggggggc ggcgggggtg
 ggctgcgggg agcgagctcc ggaccccccgc gcccccccgcc ccccccgcgc ccccccgcgc
 cagctctcc gctcccgccg cccggccggg cccatggctc tgccctctc cgcggcagggt
 cgctgcggcc cgggttctg cggccaccc ggcggggctc ctggggagggc gtctaagggg
 tctccctgg gagaggtccg tgctccccc gtcctgttcc gcttcttggc tcctccct
 gtcctccaggc agtcgggct cccggccccc ggggaggggg caggttctgg cctgtgcctc
 cccaccatc ccccgccccg gggcccagat tccggcgccc gggggggggc gggagacggc
 cggcccgctc acccgccccg gcccgcgtct gtcggcgacc gggggggcggc cagagccagg
 gaggggagagg gaagccgccc tggccctgcg acctggccgc gggcggttcca ccctgggact
 taagacctcc agtcctcatcc tccctaaggc cgggagtcca gggcccgac gcttccccc
 gagaccaggc agtccagacc ccaggcctc ctccctcaga ccttagggatc caggccccca
 gcctcttc ctcagaccc aggaggatc cagaccccg ttcccttc ctcagaccc
 ggagtccagg cccaggccct ctcctctcag accccggatc cagcctgagc tctctgcctt
 atccctgcccc cagggttttgc cggcctggc ctggctgtgc tgagcctgtg gccagatata
 gctgtcgccc ctgggccacc acctggcccc ctcaggttt cccagaccc tcggggcgag
 ctggacagca ccgtgtctc gacccgcgtct ctccctggc acacgcggca gctggctgca
 cagctggtag gagagactgg gctggggca gcacaggat gagagggcaga gaggaaacgg
 gaggagtctg cggcagcca cttggggggg ttctgggctc tcaggtggca gagtgaggga
 ggggaagagt tgggggctg gctggggggg tggagggagc cccgaggctg ggcaggggcc
 acctcacagc tttttccct gccagagggc caaatccca gctgacgggg accacaacct
 gattccctg cccaccctgg ccatgagtgc gggggcactg ggagctctac agtaagggg
 aaggggagtgg gctggggaca aggtggggagg caggcagtga aggggggggg gaggatgagg
 ggcactggtc ggggttctc tgatgtcccc gctctatccc cagctccca cgtgtctgac
 aaggctgoga gcggaacctac tgccttaccc gggcacgtg cagtgctgc gcccggcagg
 tggctcttcc ctgaagaccc tggagcccg gctgggcacc ctgcaggccc gactggacc
 gctgtcgcc cggctgcagc tcctggatg tcctggcccc aagacctgac accccagacc
 cccaccctg gccccaaaat octgtggcct gacttccctga agcctgagac cccagaccc
 agtcaacacg ccccgctctg agaccctgac accctaacag cccgctctgac gaccctgaca
 cctgaacagc cccgctctgac gacccctgacc ctaacagtcc tgctctgaga ccctgacc
 gcagtcaccaa gatccctgtgg ccctgagacc ctgaggccct agacccccaat atcctgc
 gaaacttcaa atttcaccc aagaccctgac gactccatca tccatgaccc caaagtcccc
 agatccca cccctaagacc caagacccca tcctgaagcc caaaggcttga agaattcaaa
 tcctcaccc aagacttggc gaccctggcc ccatgacatt gaaaaccat gacccggca
 ggcgtgggtg ctcacgcctg taatccca gacttgggg gccgaggccaa gtggatcacc
 tgaggctggg agttcaagac cagccagacc aacatggtga aaccctgttct ctactaaaa
 tacaaaaattt gccaggcgtg gtggtgcatg cctgtatcc cagctactt gggaggctgag
 gcaggagaat cgcttgaacc tgggaggccg aggttgcagt gagccgagat cgcacc
 cactccagcc tggcaacaa gagccaaact ccctctctt caaaaaaaaaa aaaaaaaaaa
 aaaagaagga aaagaaaaacc atggacctcc agaccctgag accccaggcc ccagccctg
 gatcctgaca tcttaaagat cccaggccct aagatacaag accttgaccc aaagccagcc
 ttgggaccct ggctgtacaa acccaagacc tccaggaccc agaccccgag ccctgaggcc
 ctatgtctca ctcccaacat cggaaaaccct gacacccctg atcctgagcc tgcgcctgta
 cgactccaag accctcaactt cccaaaggccag gccccaaagcc ctgagaccagg aagacttcaa
 accctggttc ttgggcttaa ctccaaagac cctggatctc aaattccaaat ttctagctt
 gagactccag ccctcacccca tggatccctg aacttgaacc cagagacccc atctctaaga
 cttcagcctt gagatccagg gcctgaccct agactcgagc ccacagaccc cagatactgt

FIGURE 19

31/48

ctgtaaaacc ccagctctgg tggggagcag tggctcaactc ctgtaatccc aaggcagggg
 aggccaaggc agaaggaccc ttgaggcca tgagttttag acagcctgg cagcatagca
 agactctgtt tcttaattat tattattatt attattttt ggagacagag tctcgcgctc
 ttttgcggcag gctagagtgc aatggtgcca ttccggcttgc ctggAACCC cgcctcctgg
 gtcagaagcga ttctctgccc tcagcctcct gagtagctgg gacttcagggt gcacactgcc
 acacccggat aattttttgc tatttttagta gacacagggt ttcacogtgc tgcccgaggct
 ggtcacaaac tcctgagctc aggccatccg cccgcctcg cctcccaaag cgctggata
 acaggcgtga tccccggcgc ctggcttctt aattgttcta acagcagcca caacaacaaa
 aacccagctc tgagattcca gccccggcga ctctaacagt cccaggcccg atccctcacc
 tagaaccgag atgccagccc tgactccaca gacttcaccc ccaaccccca cactcagctc
 tggaaaggccc tcctgactcc agccctccat ttcggaaaccc cacagcctga agagctccc
 gcttaaacac ttacccac ggcgcacatcgtca atatgcagcc cgcattcagc
 tgcagctcca cagccccctt gcccgtcacc cccgtcacc cccctacctg tgactcacct
 ctctcctc cccacagatg tccccggcttgc ccctgccccca gccacccccc gaccggccgg
 cggcccccgcg tccctcagct gggggggcat caggccggcc cacggccatcc
 tgggggggcgt gn₁n₂n₃ctgaca cttn₄n₅n₆tggc ccgtgggggg actgctgctg ctgaagactc
 ggctgtgacc cggggcccaa agccaccacc gtccttccaa agccagatct tattttat
 ttatattcag tactgggggc gaaacagcca ggtgatcccc cgcgcattat ctcccccttag
 tttagagacag tccttcgtg aggccctggg ggcacatctgtg ccttatttat acttatttat
 ttcaggagca ggggtgggag gcagggtggac tcctgggtcc cggaggagga ggggactggg
 gtcccgatt ctgggtctc caagaagtc gtcacagac ttctgcctg gctctcccc
 atctaggccct gggcaggaac atatattatt tatttaagca attactttc atgttggggt
 ggggacggag gggaaaggga agcctgggtt tttgtacaaa aatgtgagaa acctttgtga
 gacagagaac agggaaattaa atgtgtcata cataatccact tgaggccat ttgtctgaga
 gctggggctg gatgcttggg taactggggc agggcagggtg gaggggagac ctccattcag
 gtggaggtcc cgagttggcg gggcagcgcac tggagatgg gtcggtcacc cagacagctc
 tggggaggca gggctcgtc cttgcctggg gcccccaact gcataggccc gtttgggt
 tttttagat ggagtctcgc tctgttgctt aggctggagt gcaagtggc aatctaaggt
 cactgcaacc tccacccccc gggttcaagc aatttccttgc cctcagccctc ccgattagct
 gggatcacag gtgtgcacca ccatggccag ctaattattt atttcttttgc tatttttagt
 agagacaggg ttccacatg ttggccagc tgggttcgaa ctccctgaccc cagggtatcc
 tcctgcctcg gcctccaaa gtgctggat tacaggtgtg agccaccaca cctgaccat
 aggtcttcaa taaatattta atggaaggtt ccacaagtca ccctgtgatc aacagtaccc
 gtatggaca aagctgcaag gtcaagatgg ttcatatgg ctgtgttac catagcaaac
 tggaaacaat ctagatatcc aacagtggg gttaagcaac atggtgcatc tgtggataga
 acgccacccca gcccggcggc gcaggactg tcattcaggagg aggctaagga gagaggctt
 cttgggatat agaaagatat cotgacatg gccaggcatg gtggctcacc cctgtaatcc
 tggcacttttggaggacgaa gggactggat cactgaagtc caagatgg agaccggcct
 gcgagacatg gaaaaaccct gtctaaaaaa agaaagaatg atgtcctgac atgaaacacgc
 aggctacaaa accactgcat gctgtgatcc caattttgtg ttttttttgc tatatatgg
 ttaaaaacaaa aatcotaacag gaaaatacgc caaaatgttg acaatgactg tctccaggc
 aaaggagaga ggtgggattt tgggtgactt ttaatgtgttgc tgattgtctg tattttacag
 aatttctgccc atgactgtgtt attttgcacat ttttgcacat ttttgcacat ttttgcacat
 tagaat

wherein the codon n₁n₂n₃ and the codon n₄n₅n₆ are as defined in Figure 16A.

FIGURE 19

Radio-protection of mice treated by FPΔII-1
after irradiation at 15 Gy

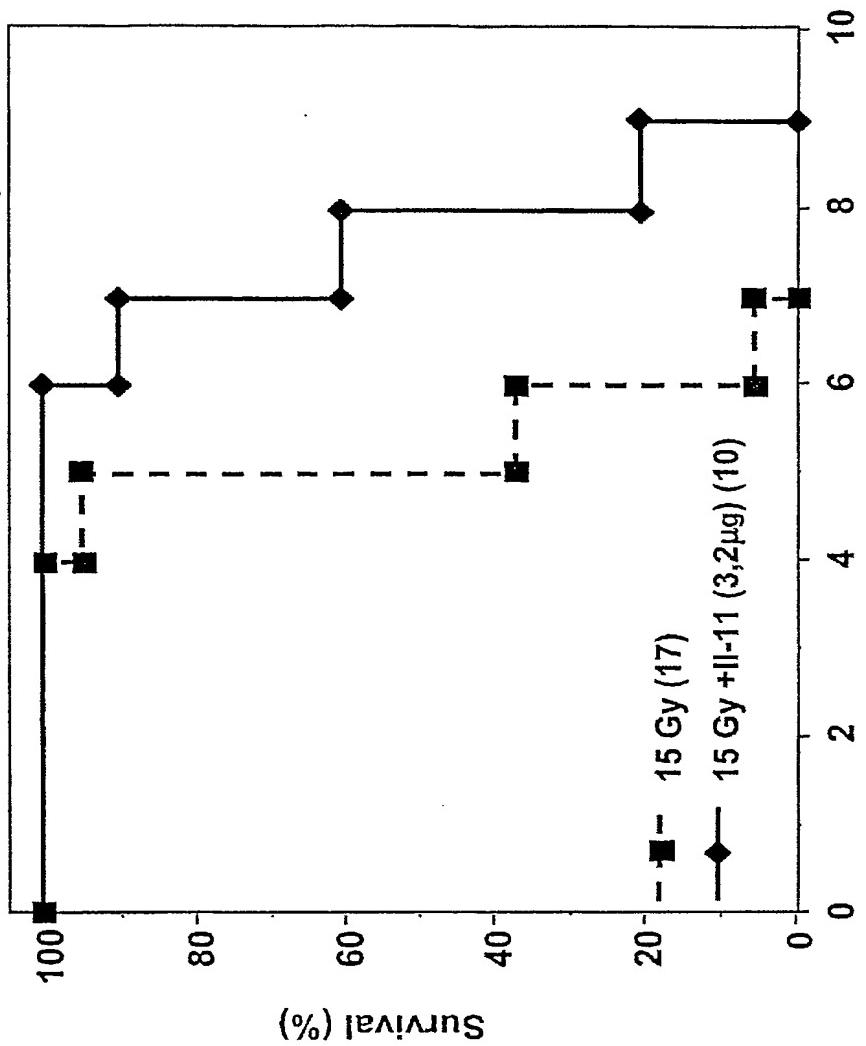


FIGURE 20

Days

Low doses of FPAII-11 mutein delay the death mice irradiated at 15 Gy

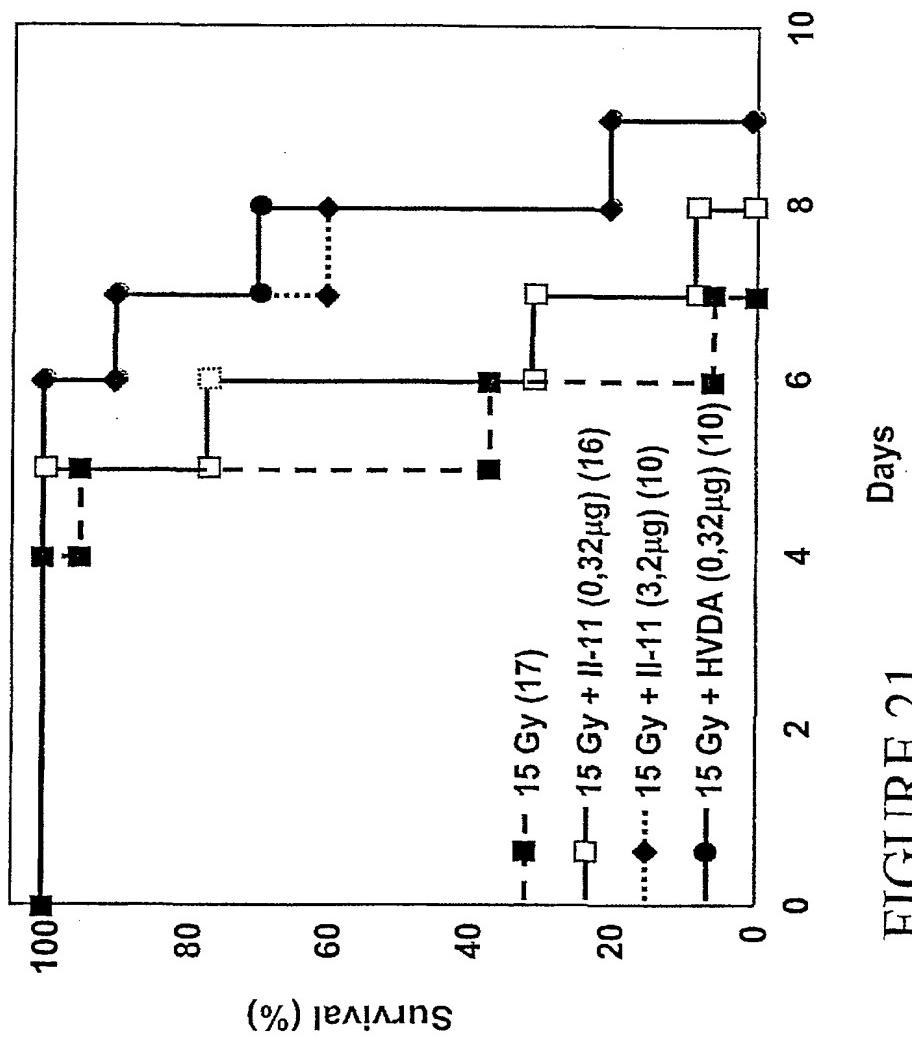


FIGURE 21

Parental (non-mutated) nucleotide sequence FPAIL-11 = SEQ ID NO:77 =

ATG GAC TAC AAG GAT GAC GAT GAC AAG GAA GGT CGT CGT GCA TCT
GTT GCA TCC CCA GAC CCT CGG GCC GAG CTG GAC AGC ACC GTG CTC
CTG ACC CGC TCT CTC CTG GCG GAC ACG CGG CAG CTG GCT GCA CAG
CTG AGG GAC AAA TTC CCA GCT GAC GGG GAC CAC AAC CTG GAT TCC
CTG CCC ACC CTG GCC ATG AGT GCG GGG GCA CTG GGA GCT CTA CAG
CTC CCA GGT GTG CTG ACA AGG CTG CGA GCG GAC CTA CTG TCC TAC
CTG CGG CAC GTG CAG TGG CTG CGC CGG GCA GGT GGC TCT TCC CTG
AAG ACC CTG GAG CCC GAG CTG GGC ACC CTG CAG GCC CGA CTG GAC
CGG CTG CTG CGC CGG CTG CAG CTC CTG ATG TCC CGC CTG GCC CTG
CCC CAG CCA CCC CCG GAC CCG CCG GCG CCC CCG CTG GCG CCC CCC
TCC TCA GCC TGG GGG GGC ATC AGG GCC GCC CAC GCC ATC CTG GGG
GGG CTG CAC CTG ACA CTT GAC TGG GCC GTG AGG GGA CTG CTG CTG
CTG AAG ACT CGG CTG TGA

Parental (non-mutated) amino acid sequence of FPAIL-11 = SEQ ID NO:78 =

MDYKDDDDKEGRRASVASPDPRRAELDSTVLLTRSLLADTRQLAAQLRDKFPA
DGDHNLDLPTLAMSAGALGALQLPGVLTRLRADLLSYLRHVQWLRRAGGSS
LKITLEPELGTIQLARLDRLRRQLLMSRLALPQPPPDPPAPPLAPPSSAWGGIRA
AHAILGGLHLTLDWAVRGLLLLKTRL

Mutated nucleotide sequence of FPAIL-11 = SEQ ID NO:79 of the invention =

ATG GAC TAC AAG GAT GAC GAT GAC AAG GAA GGT CGT CGT GCA TCT
GTT GCA TCC CCA GAC CCT CGG GCC GAG CTG GAC AGC ACC GTG CTC
CTG ACC CGC TCT CTC CTG GCG GAC ACG CGG CAG CTG GCT GCA CAG
CTG AGG GAC AAA TTC CCA GCT GAC GGG GAC CAC AAC CTG GAT TCC
CTG CCC ACC CTG GCC ATG AGT GCG GGG GCA CTG GGA GCT CTA CAG
CTC CCA GGT GTG CTG ACA AGG CTG CGA GCG GAC CTA CTG TCC TAC
CTG CGG CAC GTG CAG TGG CTG CGC CGG GCA GGT GGC TCT TCC CTG
AAG ACC CTG GAG CCC GAG CTG GGC ACC CTG CAG GCC CGA CTG GAC
CGG CTG CTG CGC CGG CTG CAG CTC CTG ATG TCC CGC CTG GCC CTG
CCC CAG CCA CCC CCG GAC CCG CCG GCG CCC CCG CTG GCG CCC CCC
TCC TCA GCC TGG GGG GGC ATC AGG GCC GCC CAC GCC ATC CTG GGG
GGG CTG GTT CTG ACA CTT GCC TGG GCC GTG AGG GGA CTG CTG CTG
CTG AAG ACT CGG CTG TGA

Mutated amino acid sequence of FPAIL-11 = SEQ ID NO:80 of the invention =

MDYKDDDDKEGRRASVASPDPRAELDSTVLLTRSLLADTRQLAAQLRDKFPA
DGDHNLDSLPTLAMSAGALGALQLPGVLTRLRADLLSYLRHVQWLRRAGGSS
LKTLEPELGTLQARLDRLLRLQLLMSRLALPQPPPDPPAPPLAPPSSAWGGIR
AHAAILGGLVLTLAWAVRGLLLLKTRL

FIGURE 23

36/48

Primers used for inverse PCR mutagenesis of FPΔIL-11:

Muteins	Primers
H182/V	G422 pACACTTGA <u>T</u> CTGGGCCGTACGGGGAC (s) SEQ ID NO:81 G412 pCAG <u>AACC</u> AGCCCCCCCAGGATGG (as) SEQ ID NO:82
D186/V	G410 pACACTT <u>G</u> TCTGGGCCGTACGGGGAC (s) SEQ ID NO:83 G421 pCAGGTGCAGCCCCCCCAGGATGG (as) SEQ ID NO:84
D186/A	G411 pACACTT <u>G</u> CCTGGGCCGTACGGGGAC (s) SEQ ID NO:85 G421 pCAGGTGCAGCCCCCCCAGGATGG (as) SEQ ID NO:86
H182/V-D186/V	G410 pACACTT <u>G</u> TCTGGGCCGTACGGGGAC (s) SEQ ID NO:87 G412 pCAG <u>AACC</u> AGCCCCCCCAGGATGG (as) SEQ ID NO:88
H182/V-D186/A	G411 pACACTT <u>G</u> CCTGGGCCGTACGGGGAC (s) SEQ ID NO:89 G412 pCAG <u>AACC</u> AGCCCCCCCAGGATGG (as) SEQ ID NO:90

FIGURE 24

37/48

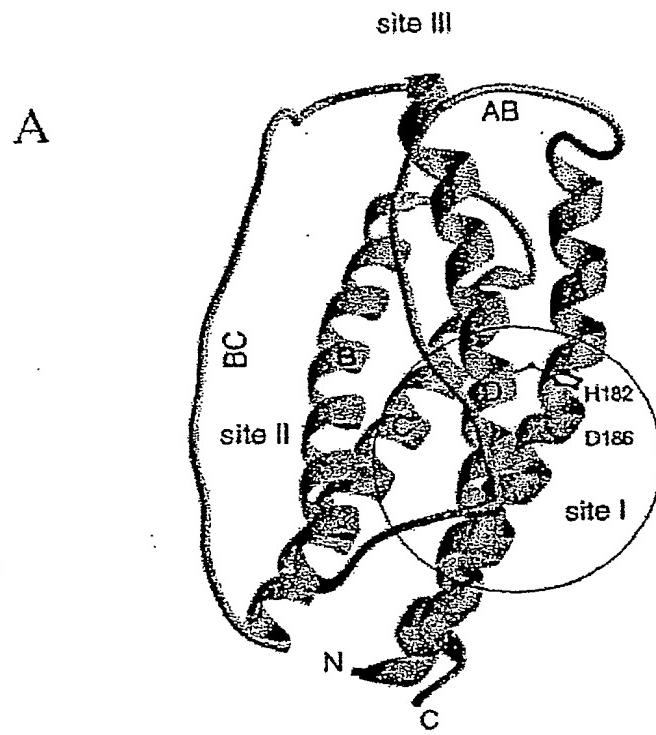


Figure 25A

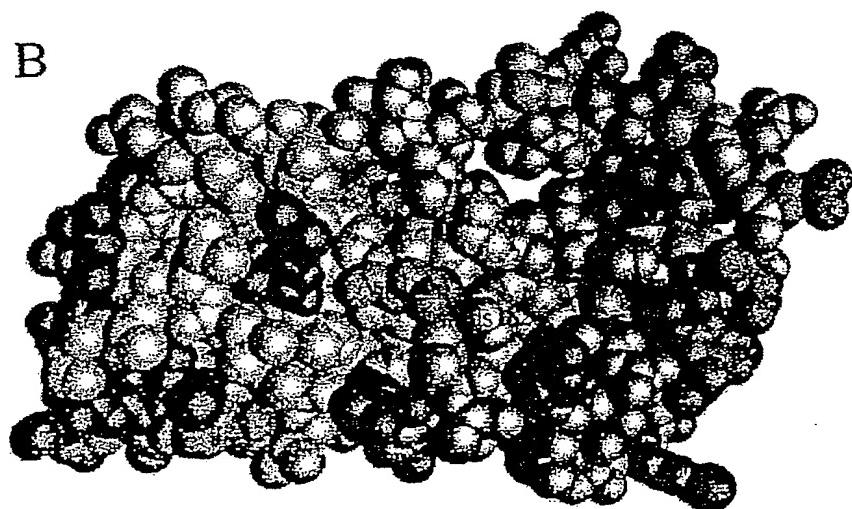


Figure 25B

38/48

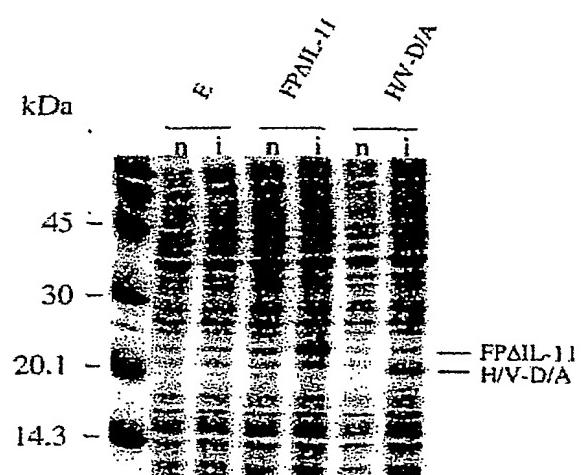


Figure 26

39/48

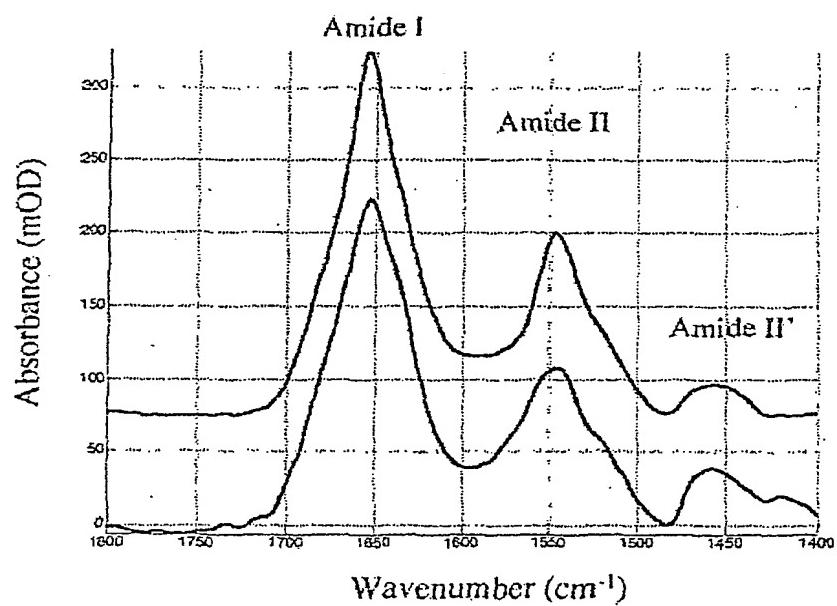


Figure 27

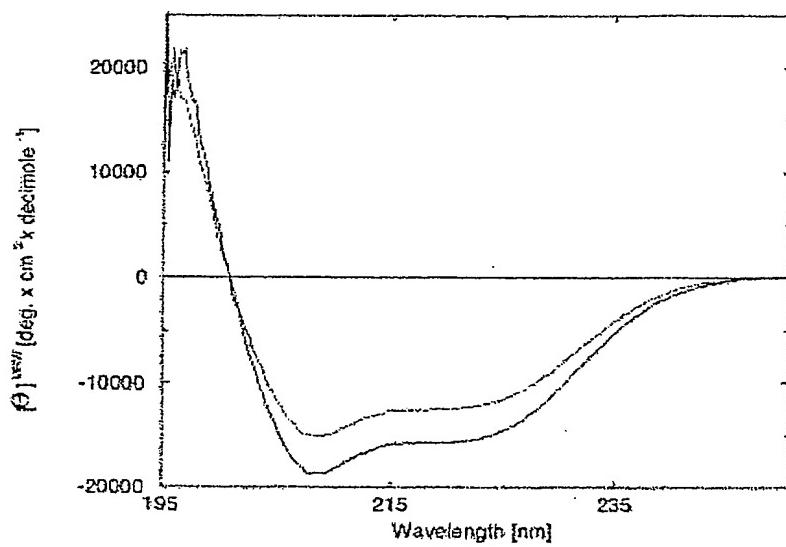


Figure 28

41/48

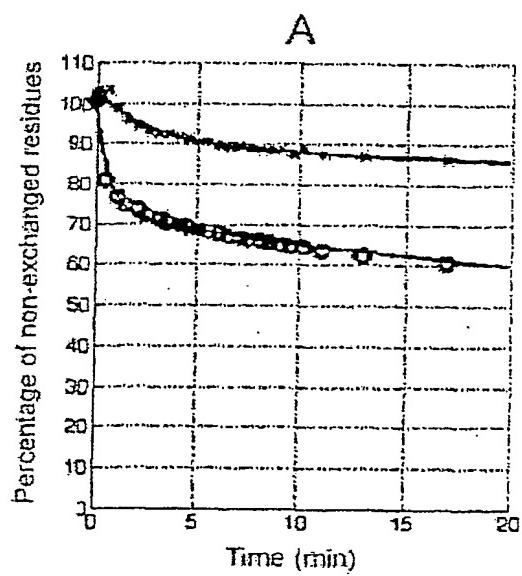


Figure 29A

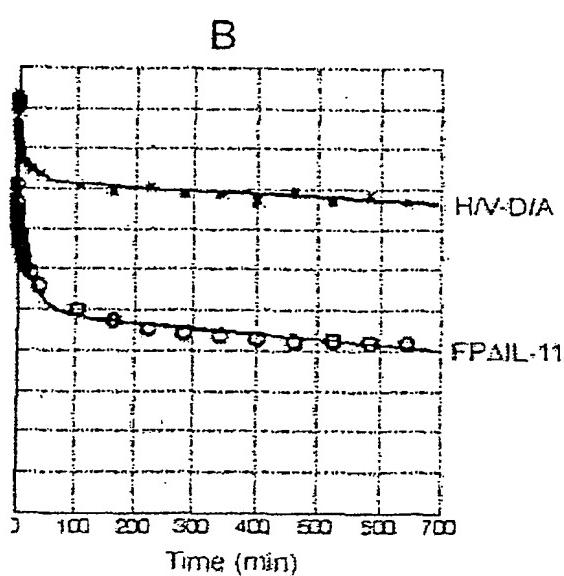


Figure 29B

42/48

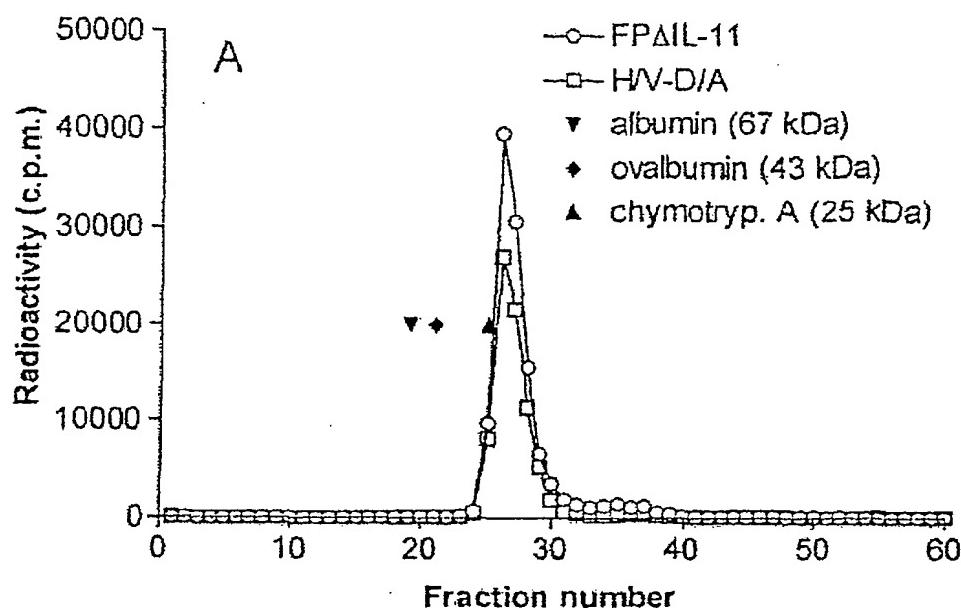


Figure 30A

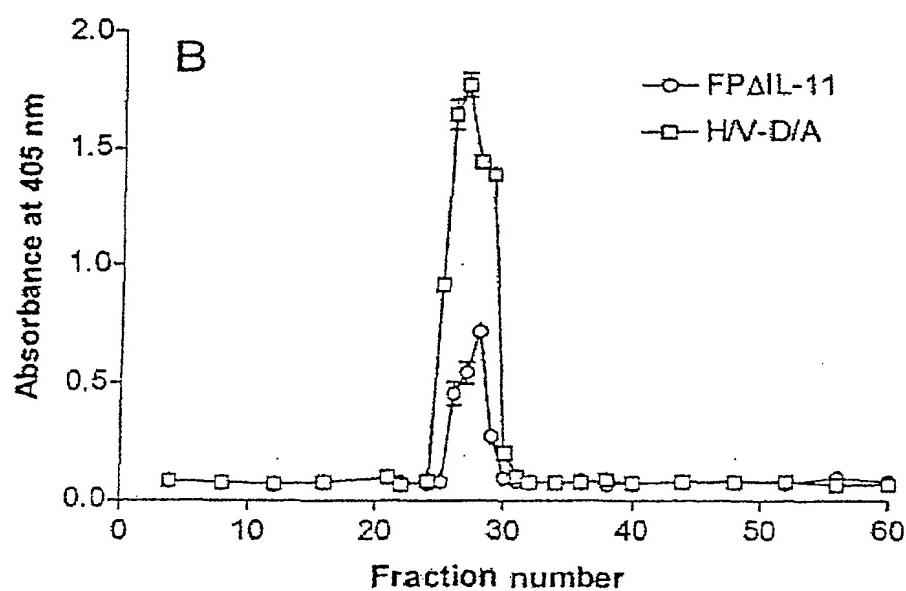


Figure 30B

43/48

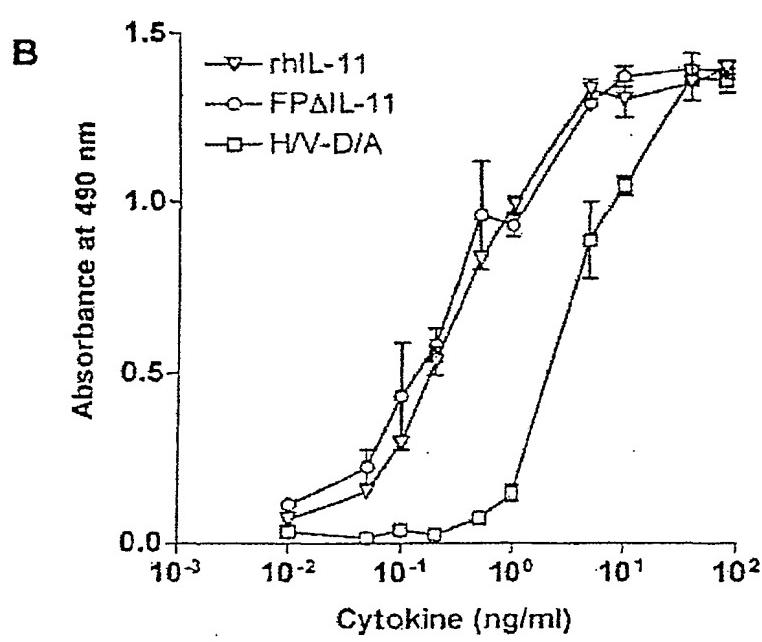
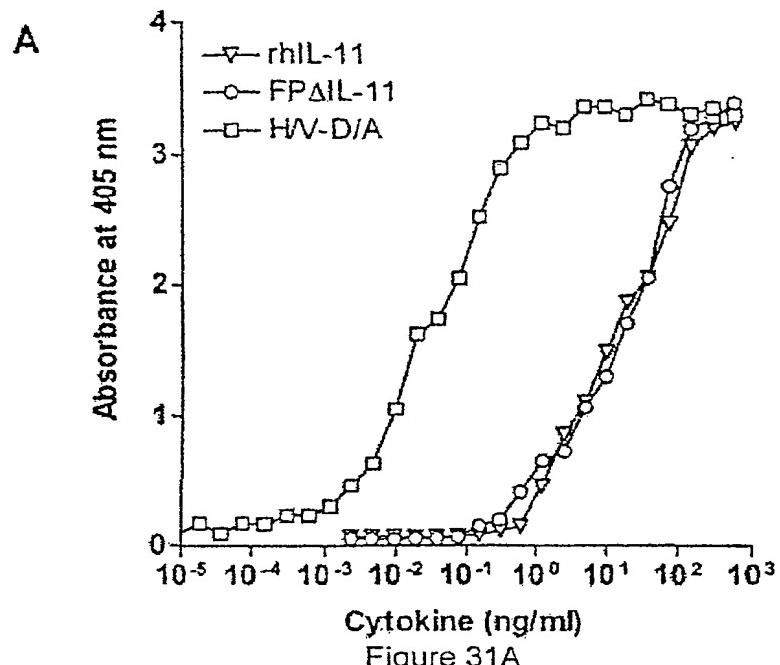


Figure 31B

44/48

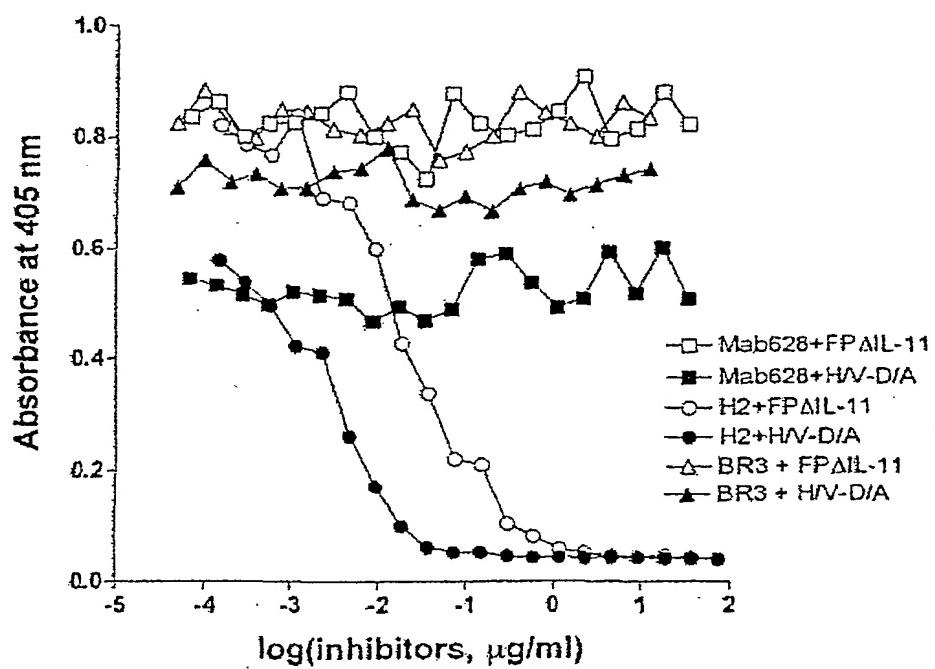


Figure 32

45/48

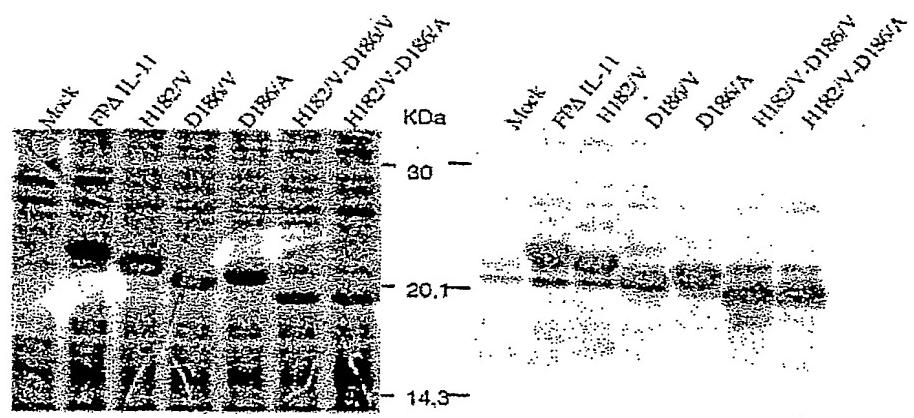


Figure 33

46/48

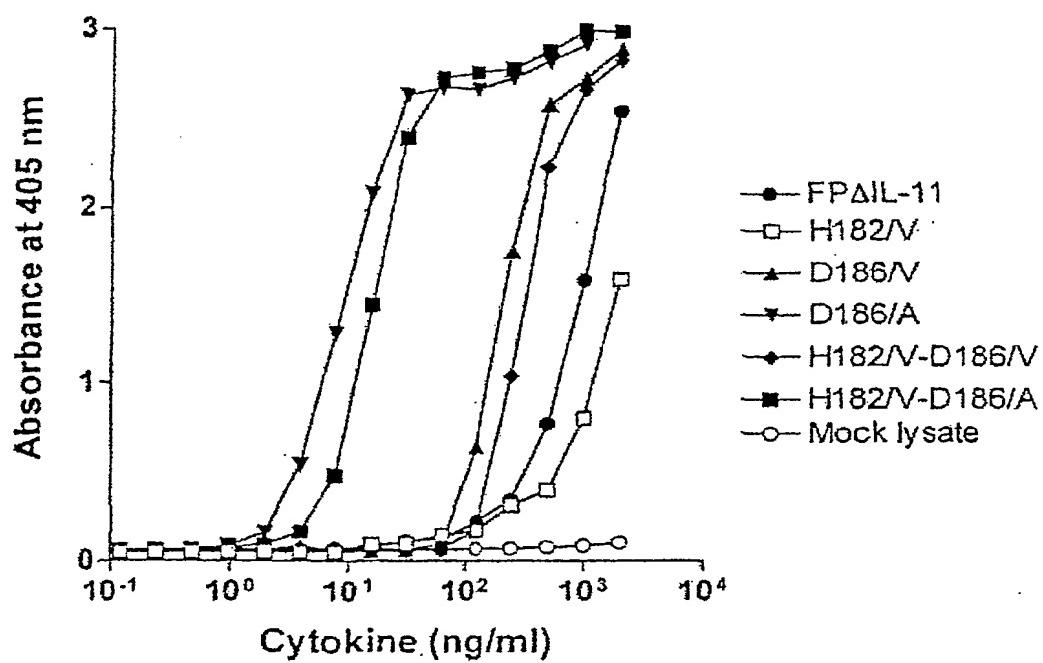


Figure 34

47/48

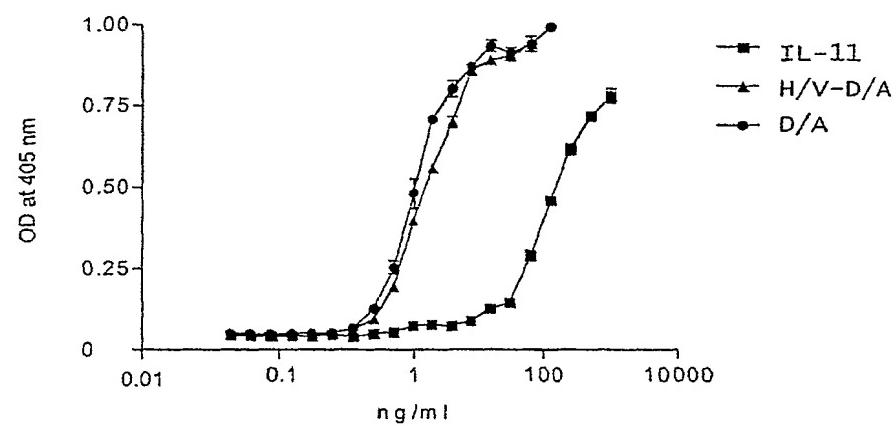


FIGURE 35

48/48

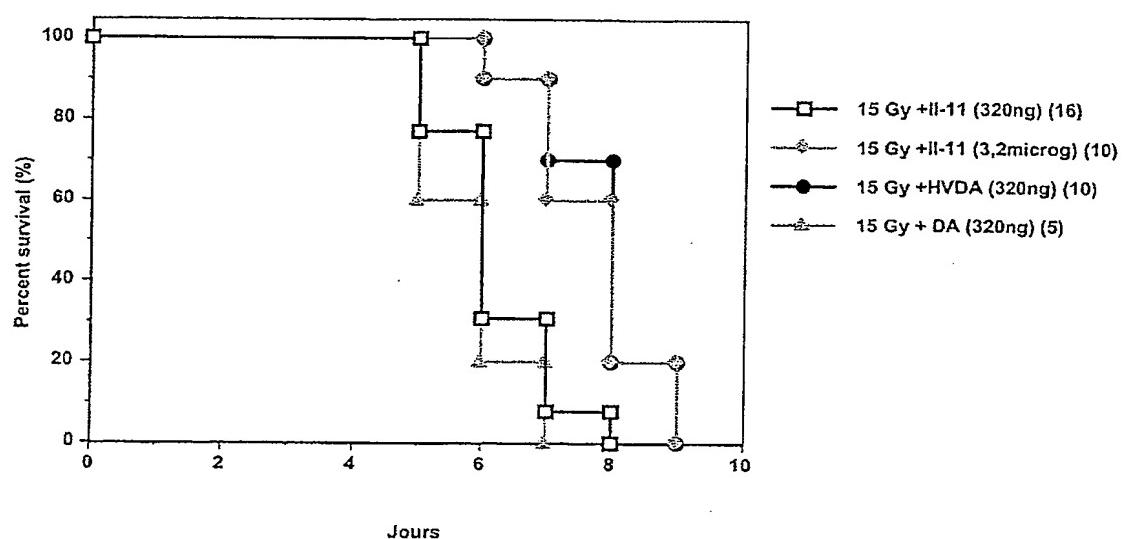


FIGURE 36